Vol. 28, Part 2 Nos. 80-222 & Indexes to Parts 1 & 2

HELMINTHOLOGICAL ABSTRACTS

incorporating

BIBLIOGRAPHY OF HELMINTHOLOGY

COMPILED FROM WORLD LITERATURE OF 1959

Prepared by the

COMMONWEALTH BUREAU OF HELMINTHOLOGY
THE WHITE HOUSE, 103 ST. PETER'S STREET, ST. ALBANS, HERTS

Published by the

Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England

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Abstracts in the present number are by:

R. C. Anderson	Grazyna I. Pozniak
S. Bingefors	W. P. Rogers
C. D. Blake	Audrey M. Shepherd
J. J. C. Buckley	J. W. Smith
H. D. Crofton	E. J. L. Soulsby
W. K. Dunscombe	I. Szladits
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VOL. 28

(1959 SECTION)

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COMMONWEALTH BUREAU OF HELMINTHOLOGY

The White House, 103 St. Peter's Street
St. Albans, England

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HELMINTHOLOGICAL ABSTRACTS

INCORPORATING BIBLIOGRAPHY OF HELMINTHOLOGY

FOR THE YEAR 1959

Vol. 28, Part 2

80—Acta Medica Italica di Malattie Infettive e Parassitarie.

a. GERBASIO, A. E. & VINGIANI, A., 1959.—"Ricerche elettroforetiche sulle modificazioni del protidoplasma nell'ascaridiosi." **14** (4), 99–101.

(80a) The serum proteins in the blood of 12 children with ascariasis were examined by electrophoresis. In three the total protein was less than 6 gm.%, serum globulins were slightly increased and the albumin: globulin ratio decreased; there were also signs of colloidal instability in these and in five other children. Four showed no changes. Although the authors attribute the alterations observed mainly to nutritional factors, they state that the possibility of the nematodes having caused damage to the liver, directly or indirectly, cannot be excluded. S.W.

81—Acta Medica Veterinaria. Naples.

a. MASTRONARDI, M., 1959.—"A proposito di una sindrome mediastinica osservata in un cane e determinata da una speciale localizzazione di *Spiroptera sanguinolenta*." **5** (3/4), 211–222. [English & French summaries p. 221.]

82—Acta Microbiologica Hellenica.

a. MAZIDIS, S. P. & DADIOTOU, D. D., 1959.—[Sur un cas de bilharziose vésicale à *Schistosoma haematobium*.] **4** (1/2), 44–56. [In Greek: French summary p. 56.]
b. LAGANA, I., 1959.—[On two cases of filariasis *Loa loa* on Greek patients coming from Belgian Congo.] **4** (3), 77–80. [In Greek: English summary p. 80.]
c. HURMUSIADIS, A., 1959.—[An autochthonous case of *Strongyloides stercoralis* infection in man.] **4** (3), 96–98. [In Greek.]

83—Acta Tropica. Basle.

a. PIRINGER, W., 1959.—"Ungewöhnlich ablaufender Fall von Onchocerciasis." **16** (3), 250–254.

84—Acta Veterinaria. Budapest.

a. KROTOV, A. I., 1959.—[Two new species of helminth parasites in vertebrates on the island of Sakhalin.] **9** (1), 7–12. [In Russian.]
b. KUROCHKIN, Y. V., 1959.—[Adaptation of helminths to parasitism in the gizzard of birds.] **9** (1), 57–65. [In Russian.]
c. SPASSKAYA, L. P., 1959.—[Cestodes of birds of Tuva. I. Dilepididae.] **9** (1), 77–100. [In Russian.]
d. OSHMARIN, P. G., 1959.—[Promorphology of Acanthocephala.] **9** (1), 109–116. [In Russian.]
e. KOVÁCS, F., 1959.—"Zur Therapie der Leberegelkrankheit von Rindern mit intramuskulär verabreichtem Tetrachlorkohlenstoff." **9** (2), 197–211.
f. KOBULEJ, T., 1959.—"Über die parasitische Phase der postembryonalen Entwicklung von *Amidostomum anseris* (Zeder, 1800)." **9** (3), 243–260.
g. RYŠAVÝ, B., 1959.—"Der Entwicklungszyklus von *Porrocaecum ensicaudatum* Zeder, 1800 (Nematoda: Anisakidae)." **9** (3), 317–323.
h. SPASSKI, A. A. & GUBANOV, N. M., 1959.—[A peculiar form of separately-sexed cyclophyllid (Cestoda).] **9** (4), 387–392. [In Russian: German summary p. 392.]
i. SPASSKAYA, L. P. & KOPAEV, Y. N., 1959.—[Morphological adaptation of the eggs of tapeworms.] **9** (4), 393–398. [In Russian.]
j. CIELESZKY, V. & KOVÁCS, F., 1959.—"The effect of carbon tetrachloride on the milk and milk products of cattle." **9** (4), 441–447.

(84a) The trematode *Crepidostomum nemachilus* n.sp. is described from the small intestine of *Nemachilus barbatus toni* from the Susuya river on Sakhalin. It differs from the nearest

species, *C. ussuriense* from marine fish, in having lobed testes and only two muscular processes on the oral sucker. The nematode *Heligmosomum petrovi* n.sp. from the small intestine of *Clethrionomys rutilus amurensis* and *C. rufocanus*, differs from the other four species in the genus with an asymmetrical bursa, *H. azerbaidjani*, *H. abberans*, *H. skrjabini* and *H. ussuriensis*, by being larger (male 11·2 mm. to 12·71 mm. and female 20·0 mm. to 21·5 mm. long), by the shape and length of the spicules (0·854 mm. to 1·00 mm.) and by the structure of the bursal rays, particularly the well marked dorsal ray. It further differs from *H. azerbaidjani* in the presence of oblique cross striation of the body and the absence of cuticular mamelons and narrow spicular alae and from *H. skrjabini* by the absence of a gubernaculum. Other characters differentiating *H. petrovi* from the four species with a symmetrical bursa but similar spicules are the absence of branches on the externo-dorsal ray, the short pre-bursal papillae, the presence of a spine on the female tail and the spicules. G.I.P.

(84b) Helminths parasitic in the gizzard of birds adapt themselves to the muscular contractions of the gizzard, its thick cuticular lining and the presence of gastroliths, by choosing a localization under the cuticular lining. The adaptations, which are biological rather than morphological in character, are discussed using as examples species of *Amidostomum*, *Epomidostomum*, *Streptocara*, *Skrjabinocara* and *Syncuaria* of poultry. G.I.P.

(84c) 22 species of Dilepididae were collected from 1,133 birds (116 species) in the Tuva region. They are listed with details of the hosts and localities in which they were found and the following are also described from the new material: *Angulariella beema*, *Choanotaenia crateriformis*, *C. macracantha*, *C. passerina*, *C. polyorchis*, *Anomotaenia chelidonariae*, *A. citrus*, *A. globula*, *A. reductorhyncha*, *A. stentorea*, *A. trigonocephala* and *A. nymphaea*. This last species is known in two variations of hook size and Spasskaya designates her specimens from *Numenius arcuatus* [*?arquata*] as *A. nymphaea* forma *megacantha* n. forma. G.I.P.

(84d) The internal organs of the Acanthocephala have retained the bilateral symmetry of their turbellarian ancestors; externally this has given way to a radial symmetry on which a bilateral symmetry (seen in the bending over of the proboscis, the distribution of cuticular armature and other features) has been superimposed on transition to a passive, fixed mode of life under the expulsive action of intestinal contents. The radial symmetry is generally retained in acanthocephalans with a more mobile mode of life and in those which, due to their position, are not subjected to the action of intestinal contents or digestive juices. G.I.P.

(84e) The efficacy against *Fasciola hepatica* and the toxicity to animals of carbon tetrachloride were studied on 200 experimental cattle and 150,000 cattle in the field. Of the various combinations tried, a 1 : 1 mixture of carbon tetrachloride and liquid paraffin to which 5 gm. % of lidocain-base (diethylamino-2-6-dimethylacetanilide HCl) have been added, proved the best for intramuscular administration. The lidocain-base dissolved well in the mixture and its anaesthetic effect was immediate, strong and lasting. Single doses of 8 ml. of this mixture per 10 kg. body-weight (maximum 40 ml.) were injected at two to three places in the neck; as a result intensities were reduced by about 90% and from 75% to 91% of the cattle were cured. The treatment is easy and cheap, a preliminary hunger diet is not necessary and the effect on the liver is insignificant. G.I.P.

(84f) Kobulej has studied the second, parasitic, phase of development of *Amidostomum anseris*. [For abstract of his work on the embryonic and post-embryonic development of *A. anseris* see Helm. Abs., **25**, No. 333h.] The third-stage larvae exsheathed two hours after infection of geese and the first signs of growth and development were observed after 40 to 48 hours. The fourth-stage larva, which is 950 to 1,000μ long, exsheathed 62 to 72 hours after infection; it possesses a strongly sclerotized mouth capsule. Kobulej describes the morphogenesis of the organs. The fourth moult occurred after eight days when the larva was 4·8 to 6·0 mm. long and by which time the organs had formed or their primordia differentiated. On the 12th day copulating pairs and on the 14th day eggs in the female uterus were first seen. Eggs were passed by the host not earlier than 17 days after infection. G.I.P.

(84g) Ryšavý has studied the life-cycle and the embryonic development of *Porrocaecum ensicaudatum* in eggs obtained from *Turdus merula*. The first-stage larvae become fully developed and capable of infecting *Lumbricus terrestris*—a new intermediate host for *P. ensicaudatum*—after 12 to 14 days at 20°C. to 22°C. In the earthworms the larvae moulted after seven to ten days and their description agreed with that given by Osche in 1955 [for abstract see Helm. Abs., **24**, No. 174e]. To complete the cycle, two *T. merula* were infected with the third-stage larvae and killed four and twelve days later. In the second bird the larvae were free in the lumen and had changed morphologically indicating that they had moulted between the 4th and 12th day. G.I.P.

(84h) *Shipleya dioica* n.sp. is described and figured from *Limnodromus griseus scolopaceus* from the area of the Kolyma river. The new species is very near to *S. inermis* in the structure of the scolex, the mode of fixation and particularly in the morphology of the female segments. In the male segments, however, there is only one testis and not 20 to 25 as described by Baer [see *Parasitology*, 1940, **32** (2), 174–197]. Furthermore, in the new species the testis and the seminal receptacle are never in the same segment (as described by Baer for *S. inermis*), the male and female organs being in separate segments of a strobila. Spasski & Gubanov suppose that Baer was dealing with the same species as the newly described one but that in his description the sex organs were wrongly identified mistaking the lobes of the ovary for the testes and the uterus for the seminal receptacle. [See also abstract of the work by Voge & Rausch on *S. inermis* in Helm. Abs., **25**, No. 247t.] G.I.P.

(84i) The authors describe the microscopic structure of the long filaments found at the poles of the eggs of *Anomotaenia globula* and the mechanism by which the eggs are joined together into bands. This facilitates their firm attachment to the substratum. They discuss the significance of this in the life-cycle of this cestode. G.I.P.

(84j) A method for the detection of carbon tetrachloride in milk and milk products has been evolved which is based on Rogers & Kay's (1947) procedure for the determination of carbon tetrachloride in air and which allows detection of less than 1·0 mg. of carbon tetrachloride per litre and is exact to within $\pm 5\%$. Carbon tetrachloride injected intramuscularly in therapeutic doses is excreted in milk in amounts too small to affect its taste or smell. G.I.P.

85—Agricoltura delle Venezie.

a. DONÀ DALLE ROSE, A., 1959.—"Il nematode della barbabietola. Alcune osservazioni sulla biologia dell'*H. schachtii* nella Valle Padana." **13** (7/8), 334–340.

b. DONÀ DALLE ROSE, A., 1959.—"Il nematode della barbabietola. II. Fuoruscita delle larve di *Heterodera schachtii*, movimenti nel terreno e nell'interno delle radici." **13** (9), 400–404.

86—American Journal of Clinical Pathology.

a. ROSENBERG, E. & BLACK, H., 1959.—"The value of biopsy of cores of fresh hepatic tissue in the diagnosis of schistosomiasis." **32** (5), 472–473.

(86a) Schistosome eggs may be readily identified in cores of fresh liver tissue, removed with a Menghini needle, placed in a drop of physiological saline or glycerol and compressed between a slide and coverslip. This procedure is said to be of more value in the diagnosis of hepatic schistosomiasis than the examination of fixed and stained specimens and is that previously used by Yoshizumi (1954) [for abstract see Helm. Abs., **23**, No. 837c]. J.W.S.

87—American Journal of Gastroenterology.

a. MUHLEISEN, J. P. & SWARTZWELDER, J. C., 1959.—"Therapy of strongyloidiasis with dithiazanine." **32** (3), 317–327. [Discussion p. 327.]

(87a) Evidence of *Strongyloides stercoralis* infection was not demonstrable from stool examination or in duodenal drainage aspirates in 29 of 32 patients who had received dithiazanine tablets. The initial dosage of 200 mg. thrice daily two hours after meals for five days was reduced to 300 mg. per day for 21 days. Detailed reports are given of five of the cases treated. Side reactions were mild and infrequent. R.T.L.

88—Anais do Instituto de Medicina Tropical. Lisbon.

a. FRAGA DE AZEVEDO, J. & CARVÃO GOMES, F., 1959.—"A aplicação de algumas provas serológicas e cutâneas no diagnóstico de certas helmintíases." **16** (1/4), 5–13. [English & French summaries p. 12.]

b. FRAGA DE AZEVEDO, J., COSTA MOURÃO, M. & CASTRO SALAZAR, J. M., 1959.—"Ensaio terapêutico com o anti-helmíntico Alcopar na ilha do Príncipe." **16** (1/4), 15–37. [English & French summaries p. 37.]

c. FRAGA DE AZEVEDO, J., COSTA MOURÃO, M. & CASTRO SALAZAR, J. M., 1959.—"Ensaio terapêutico com o anti-helmíntico ditiazanina na ilha do Príncipe." **16** (1/4), 39–51. [English & French summaries p. 51.]

d. MORAIS, T. DE, 1959.—"A bilharziose em Moçambique." **16** (1/4), 179–186. [English & French summaries p. 186.]

e. MORAIS, T. DE, 1959.—"Subsídios para o estudo dos moluscos hospedeiros intermediários da bilharziose nos distritos de Moçambique, Niassa e Cabo Delgado (Província de Moçambique)." **16** (1/4), 187–198. [English & French summaries pp. 197–198.]

f. OLIVEIRA LECUONA, M. DE, 1959.—"Primeiros dados sobre a distribuição da oncocercose na Guiné Portuguesa." **16** (1/4), 199–208. [English & French summaries p. 208.]

g. GONÇALVES FERREIRA, E. & ALMEIDA GOMES, J., 1959.—"Bilharziose o foco de Malanje (Angola). (Subsídio para o conhecimento das bilharzioses em Angola)." **16** (1/4), 407–432. [English & French summaries pp. 431–432.]

h. CARVALHO, R. G. DE, 1959.—"Contribuição para o estudo da bilharziose no posto-sede da Delegacia de Saúde dos Ganguelas." **16** (1/4), 433–436. [English & French summaries p. 436.]

i. MOURA PIRES, F., SANTOS DAVID, J. H. & OLIVEIRA E SILVA, J. A. A., 1959.—"Contribuição para o estudo das filaríases na Lunda. I. Microfilárias sanguícolas: incidência e espécie infestante na circunscrição do Chitato." **16** (1/4), 461–479. [English & French summaries pp. 477–479.]

(88a) Complement fixation and intradermal tests were performed using antigens from *Fasciola hepatica* and *Schistosoma bovis* diluted 1: 100 and 1: 10,000 respectively. With *F. hepatica* in intradermal tests, all of six infected persons were positive and of 80 uninfected six were doubtful and 74 negative; in complement fixation tests of six infected persons five were positive and one serum was anticomplementary and of 350 uninfected 306 were negative, 17 were doubtful and 27 were anticomplementary. With *S. bovis* in intradermal tests on 60 healthy persons two reacted doubtfully and 58 negatively; in complement fixation tests one infected person was positive and of 220 uninfected 212 were negative, three doubtful and five anticomplementary. It is concluded that both antigens were sensitive and specific. W.K.D.

(88b) Both *Ancylostoma duodenale* and *Necator americanus* are prevalent on the island of Principe. 122 persons aged from one to 50 years, 70 of whom also had *Ascaris* infection, were treated with Alcopar by three different schedules, two of which involved one dose (2·5 gm. bephenium base), the third involving one dose on two successive days; the results showed little difference. In the dosage given the drug caused a 75% reduction of both hookworm and *Ascaris* but only rarely cured the patients completely. It was not effective against *Trichuris trichiura* or *Strongyloides stercoralis*. W.K.D.

(88c) Ninety-two persons of both sexes, mostly schoolchildren aged five to 15 years, on Principe island, nearly all of whom were infected with *Trichuris* and *Ascaris* and some with *Strongyloides* and hookworm, were treated with dithiazanine as follows: first day, 10 mg. per kg. body-weight divided into three doses given at 6 a.m., 11 a.m. and 5 p.m., second to fifth days, 20 mg. per kg. in three doses. The maximum daily dose was 600 mg. (6 enteric coated tablets). The drug was effective against *Trichuris*, *Ascaris* and *Strongyloides* but not against hookworm. W.K.D.

(88d) Infections with both *Schistosoma haematobium* and *S. mansoni* occur in Mozambique, the former throughout the province, *S. mansoni* only in widely separated foci. 4·6% of the inhabitants are infected and 90% of the infections are vesical. Snails found naturally infected were *Physopsis globosus*, *P. africanus* and *Biomphalaria pfeifferi*. The first-named is the most abundant and the principal vector of *S. haematobium*. In certain districts autochthonous infections were found but no infected snails. An initial small experimental scheme of control among Europeans in the special irrigation area in the Limpopo valley is proposed. W.K.D.

(88e) Three areas of Mozambique were examined for vectors of bilharziasis. *Bulinus (Physopsis) globosus*, *B. (P.) africanus* and *Biomphalaria pfeifferi* were found naturally infected. The other fresh-water snails found are listed. *B. forskalii* was by far the most abundant non-vector. A simple-tailed and two kinds of furcocercous cercariae, one with a short and the other with a longer tail, were found. W.K.D.

(88f) According to the inhabitants, onchocerciasis is of relatively recent origin in Portuguese Guinea. 384 of 2,585 persons examined were infected, mostly over 30 years of age. 160 of these had some eye condition attributable to the infection and 15 were blind. The vector is *Simulium damnosum*, the average infection rate in which is over 19%. W.K.D.

(88g) Vesical bilharziasis is extremely prevalent in the Malanje area of Angola. Of a total population of 182,136, 27,577 urines were examined and 43% found positive, while faeces from 3,227 natives showed no *Schistosoma mansoni* and only two cases of *S. haematobium* infection. W.K.D.

(88h) This is a report on *Schistosoma haematobium* infections of the inhabitants of an area in Angola. The apparent minimal infection rate was 33% [but it is not clear how the infection indices given in the table were arrived at]. W.K.D.

(88i) In an area of north-eastern Angola 10,572 persons, most of whom were over 15 years of age, had a blood film taken during the daytime. 5,659 showed microfilariae; in 450 films stained with Giemsa only *Acanthocheilonema perstans* was identified. The incidence increased with age but an average of 50% of the population were infected. W.K.D.

89—Anales del Instituto de Biología. Mexico.

a. CABALLERO Y C., E., 1959.—"Tremátodos de la tortugas de México. VII. Descripción de un tremátodo digéneo que parasita a tortugas marinas comestibles del Puerto de Acapulco, Guerrero." **30** (1/2), 159–166. [English summary p. 165.]
b. CABALLERO Y C., E. & BRAVO HOLLIS, M., 1959.—"Tremátodos de peces de aguas mexicanas del Pacífico. XVII. Dos nuevos géneros de Monogenoidea Bychowsky, 1937." **30** (1/2), 167–181. [English summary pp. 179–180.]
c. WINTER, H. A., 1959.—"Algunos tremátodos digéneos de peces marinos de aguas del Océano Pacífico del sur de California, U.S.A. y del litoral mexicano." **30** (1/2), 183–208. [English summary p. 206.]
d. BRAVO HOLLIS, M. & BRENES, R. R., 1959.—"Helmintos de la República de Costa Rica. X. Nematoda 4. Sobre la posición taxonómica de los géneros *Ozolaimus* Dujardin, 1845 y *Macracis* Gedoelst, 1916." **30** (1/2), 209–225.

(89a) *Cymatocarpus undulatus* Looss, 1899 is redescribed and figured from the edible marine turtle *Chelone mydas*. *Distomum soleare* Braun, 1901 is considered a synonym of *C. undulatus* because the metraterm, which was described and figured by Braun as a part of the male copulatory organ, was wrongly interpreted by him. R.T.L.

(89b) *Mexicana bychowskyi* n.g., n.sp., parasitic on fishes of the family Sciaenidae, differs from other members of the subfamily Tetraonchinae in having a bilobed opisthaptor wider than the posterior part of the body and armed with two pairs of anchors; the smaller and wider ventral transverse bar is butterfly-shaped with latero-ventral expansions; the dorsal transverse bar is simpler, wider and non-articulating. With each anchor there is an irregularly fenestrated sclerosed membrane layer on the sides of the opisthaptor. *Paracalceostoma calceostomoides* n.g., n.sp., parasitic on the fish *Haemulon scudderi*, belongs to the family Calceostomatidae. The prohaptor is large and cup-shaped with lappets but lacks glands. The opisthaptor is small with two muscular suckers as adhesive organs; its armature is rudimentary and formed of very small elements bordering the opisthaptor; on the median posterior margin of the opisthaptor there is an anchor-like structure; six small clamp-like structures each with a hook at its base are present along the free edge of the opisthaptor. R.T.L.

(89c) Winter redescribes ten species of Digenea recently collected from fishes on the coasts of the South Californian and Mexican Pacific Ocean, viz., *Bucephalus scorpaenae* in *Scorpaena guttata*, *Prosorhynchus pacificus* and *Lepidapedon hancocki* in *Epinephelus analogus*, *Stephanostomum californicum* in *Genyonemus lineatus*, *Helicometrina elongata* in *Girella nigricans* and *Gibbonsia metzi*, *H. nimia* in *Scorpaenichthys marmoratus*, *Paracryptogonimus mexicanus* in *Cirrhitus rivulatus*, *Petalodistomum pacificum* in *Galeorhinus zyopterus*, *Xystretum caballeroi* in *Balistes capistratus* and *Sphaeroides lobatus*, and *Diplangus macrovitellus* in *Cymatogaster aggregatus*. As *Nagmia* Nagaty, 1930 is considered a synonym of *Petalodistomum* Johnston, 1913, *N. floridensis* becomes *Petalodistomum floridensis* (Markell, 1953) n.comb. and *Proctoeces macrovitellus* is transferred to *Diplangus* as *D. macrovitellus* (Winter, 1954) n.comb. R.T.L.

(89d) Following a discussion of the definitions given by various authors for the genus *Ozolaimus*, the authors consider that *Macracis* Gedoelst, 1916 must be considered a synonym of *Ozolaimus*. *Macracis monhystera* becomes *O. monhystera* (Linstow, 1902) n.comb. with *O. ctenosauri* and *Macracis prolixa* as its synonyms. *Ctenosaura s. similis* is reported as a new host for *O. cirratus*. R.T.L.

90—Anales de la Real Academia de Farmacia. Madrid.

a. JIMÉNEZ MILLÁN, F., 1959.—"Hallazgo de un 'ascaridae' vivo en el interior de un huevo de gallina." **25** (2), 141–145. [English summary p. 144.]

(90a) A live, sexually immature, female *Ascaridia galli* was found in an apparently normal hen's egg. W.K.D.

91—Annales Medicinae Experimentalis et Biologiae Fenniae.

a. LAINE, T., PÄTIÄLÄ, R., PARMALA, M. E. & LOKKI, O., 1959.—"Diphyllobothriasis as an infectious disease in Finland." **37** (3), 251–261.

(91a) Laine *et al.* estimate that approximately one-fifth of the population of Finland suffer from diphyllobothriasis. Their statistics, based on the sale of anthelmintics to dispensing chemists in 1950–52, are combined with those of earlier surveys based on questionnaires sent to physicians and on examination of isolated sections of the population. The highest incidence is in lake districts and in other areas where the habit of eating lightly salted raw fish is prevalent. A map of Finland shows the incidence of infection per 100,000 inhabitants for 1957 based on statistics compiled by the State Medical Board. A total of approximately 48 million marks was spent on anthelmintics over the three years, i.e. about four marks per head of population per annum. J.W.S.

92—Annales Medicinae Internae Fenniae.

a. KAIPAINEN, W. J. & OHELA, K., 1959.—"The effect of intrinsic factor on the Schilling test in pernicious tapeworm anemia." **48** (4), 183–190.
b. KAIPAINEN, W. J. & IKKALA, E., 1959.—"The metabolic activity of *Diphyllobothrium latum* and its relation to 'viable ova'." **48** (4), 191–196.

(92a) The Schilling test assesses the amount of radio-active vitamin B_{12} (tagged with Co^{60}) excreted in the urine. Eight of ten patients suffering from megaloblastic anaemia due to fish tapeworm had no free hydrochloric acid in the gastric juice. All showed improvement in the Schilling test even without expulsion of the worm when vitamin B_{12} plus intrinsic factor were administered. W.K.D.

(92b) The viability of the ova of *Diphyllobothrium latum* was tested by the uptake of radio-active vitamin B_{12} by the worm and the eosin staining of the ova. The vitamin was given the evening before the expulsion process started. After expulsion the vitamin was found only in the first four metres. Ova of the posterior proglottides stained with eosin and hence were dead. There appeared to be no correlation between affinity of ova for the stain and uptake of vitamin. W.K.D.

93—Annali della Facoltà di Medicina Veterinaria. Pisa.

a. BONO, G. DEL, PELLEGRINI, N. & EMDIN, R., 1959.—"Su rare localizzazioni della ciste da echinococco. Echinococcosi linfonodale in bovino." Year 1958, **11**, 181–193. [English & French summaries p. 193.]

b. MORTELLI, U. & GABBANINI, P., 1959.—"Le alterazioni dei linfonodi periportali nella echinococcosi dei bovini e degli ovini." Year 1958, **11**, 194–200. [English & French summaries p. 199.]

c. SALUTINI, E., 1959.—"Il comportamento della chetonemia in bovine affette da parassitosi epatiche." Year 1958, **11**, 209–218. [English & French summaries p. 217.]

d. BONO, G. DEL, FAVATI, V. & EMDIN, R., 1959.—"Microascaridiosi sperimentale del suino da *Toxocara canis*. (Nota preventiva)." Year 1958, **11**, 232–238. [English & French summaries pp. 237–238.]

e. LUCCHESE, A. DEL, 1959.—"Sulla organizzazione linfatica in polmone di suino colpito da metastrongilosi." Year 1958, **11**, 239–248. [English & French summaries p. 247.]

(93c) Salutini determined the blood levels of acetone, acetoacetic acid, beta-hydroxybutyric acid and of total ketone bodies in 15 cattle with hydatid of the liver and lungs and in 15 cattle with liver-fluke. An increase of these levels, as compared with healthy controls, was only evident in cattle with liver-fluke. N.J.

(93d) Embryonated eggs of *Toxocara canis* were given *per os* to two young pigs at a dose of 1,000 given five times at intervals of five days. Ten days after the last dose, lesions were found in the liver, resembling those of "multiple parasitic swine hepatitis". Miliary and submiliary nodules were observed in the lungs and well preserved larvae were found in the small nodules. Lesions were also found in the liver. The paper is illustrated with five photomicrographs. N.J.

(93e) Lymphatic formations, resembling real lymphatic glands, were observed between the pleural membranes of the lungs in pigs with heavy metastrongyle infection. It is suggested that these formations were induced by the infection. N.J.

94—Antibiotic Medicine and Clinical Therapy. New York.

a. VILLAREJOS, V. M. & SALDAÑA, J., 1959.—"Mass deparasitization experiment with dithiazanine iodide." **6** (12), 718–723.

(94a) That dithiazanine iodide is an efficient and innocuous polyvalent anthelmintic suitable for mass treatment of a community, is illustrated by its successful use in the village of Covendo, Bolivia, which is inhabited by Mozetene Indians where 352 received a daily dose of 200 mg. enteric coated tablets for five days. The usual diet was followed and no purgative was given. The drug was well tolerated except in five instances where there was severe vomiting. 310 of 320 individuals with *Ascaris lumbricoides* were negative after five days and 305 were still negative after one month. Of 286 persons with *Trichuris trichiura*, 284 were negative after treatment and 280 a month later. 186 of 241 cases of *Strongyloides* were cured. The drug was less effective against *Necator americanus*. Only 53 of 311 infected persons were negative immediately after treatment but this rose to 73 one month later. Three persons with *Hymenolepis nana* and two with *Taenia solium* were negative one month after treatment. In an additional case of *T. solium* infection the worm was not expelled completely. R.T.L.

95—Antibiotics Annual. New York.

a. LOUGHLIN, E. H., GITTINGER, W. C. & MULLIN, W. G., 1959.—"Glucosamine treatment of *Schistosoma mansoni*." Year 1958–59, pp. 117–120.

(95a) Glucosamine (2-amino-*d*-glucose) which Bueding *et al.* found to interfere with the internal carbohydrate metabolism of *Schistosoma mansoni* in mice [for abstract see Helm. Abs., **23**, No. 301a] has proved remarkably effective in causing a clinical remission of symptoms in 14 Puerto Rican patients by interfering with the egg-laying capacity of the worms without causing any immediate or delayed toxic reactions. The drug was dissolved in coffee or mixed with cereal and in the later tests the amount used was 12 gm. daily for 21 days and its effect was checked by rectal biopsies made before and after its administration. R.T.L.

96—Archiv für Geflügelkunde.

a. ENIGK, K. & STICINSKY, E., 1959.—"Zur Biologie und Bekämpfung der häufigsten Hühnerbandwürmer." **23** (4), 247–256. [English summary p. 255.]

b. KLIMEŠ, B. & BAŠTA, J., 1959.—"Zur Bionomie der unreifen Stadien von *Ascaridia galli* und zur Behandlung der befallenen Küken mit Benzin, Tetrachlorkohlenstoff und Piperazin." **23** (6), 409–416. [English summary p. 416.]

(96a) 325 chickens were experimentally infected with four tapeworms. With *Davainea proglottina* infections of 1,500 worms were achieved, with *Hymenolepis carioca* of up to 70 and with *Raillietina cesticillus* and *Choanotaenia infundibulum* of about 20. The infections were not pathogenic but weight increases and egg-laying were markedly reduced. In well-fed hosts, each *Davainea* worm produced one proglottis per day, while in the other three the number of proglottides produced and periods of passing were irregular. Oncospheres outside the host survived for one to three days; all those of *Davainea* and 30% of the others developed to cysticercoids. The prepatent period was 12 days although in *Raillietina*, *Hymenolepis* and *Choanotaenia* it may extend to 20 days. Published data by these and other authors on intermediate hosts and on control is recounted. G.I.P.

(96b) Chicks aged 18 days were given 465 *Ascaridia galli* eggs as a single dose and those aged five weeks 640 eggs in a single dose or in three doses at four-day intervals, this leading to heavier infections. The larvae settled chiefly in the lumen of the middle section of the small intestine. Reductions in weight gains were insignificant in birds on a protein-rich diet. Self-cure occurred in a high proportion of the birds, thus on the 28th to 33rd day after infection a third of the 18-month-old chicks were negative. Infected birds were treated with either 2·5 ml. per kg. body-weight of medicinal benzine, 1·5 ml. per kg. of carbon tetrachloride or 225 mg. per kg. of piperazine citrate, and 95·1%, 67·6% and 84·6% respectively were cured. Efficacies calculated on the total number of worms to the number passed were 99·5%, 83·9% and 98·1%. The 28 to 33-day-old immature ascarids proved less resistant to treatment than the 6 to 13-day-old larvae of an earlier experiment. G.I.P.

97—Archives de l'Institut d'Hessarek.

a. MAGHAMI, G., ALAVI, A. & KHALILI, K., 1959.—"Moniéziose des ovins en Iran et son traitement par l'arséniate de plomb." No. 11, pp. 44–47.

(97a) Good therapeutic results were obtained with 0·5 gm. of lead arsenate per head against *Moniezia benedeni* in three sheep and against *M. expansa* in a flock of lambs, 50% of which were infected. In Iran, these two cestodes occur more frequently among sheep than *Avitellina centripunctata* and *Helicometra giardi*. N.J.

98—Archives de l'Institut Pasteur d'Algérie.

a. BALOZET, L., 1959.—"*Muspicea borreli* L. W. Sambon, 1925." **37** (4), 572–576.

(98a) Balozet records the occurrence of the rare nematode *Muspicea borreli* Sambon, 1925 in mice reared at the Pasteur Institute of Algeria, but owing to lack of details of its morphology he is unable to contribute to its systematic position. Its life-cycle still remains unsolved. R.T.L.

99—Archives of Internal Medicine.

a. BROOKS, Jr., T. J., WEBB, W. R. & HEARD, K. M., 1959.—"Hydatid disease. A summary of human cases in Mississippi." **104** (4), 561–567.

100—Archives of Neurology. Chicago.

a. KIM, S. K., 1959.—"Cerebral paragonimiasis. A report of forty-seven cases." **1** (1), 30–37.

101—Archives Roumaines de Pathologie Expérimentale et de Microbiologie.

a. HACIG, A. & SOLOMON, P., 1959.—"Contribution à la sérologie des helminthiases. I. La préparation d'antigènes vermineux et de sérums immuns homologues. II. Les réactions antigène-anticorps *in vivo* et *in vitro* exécutées avec des antigènes d'helminthes et les sérums immuns respectifs." **18** (1), 107–122. [English, German & Russian summaries pp. 121–122.]

(101a) The first part of this paper describes techniques used to prepare antigens (six methods) from *Ascaris* of man and pigs and from *Taenia saginata* and to prepare immune sera in rabbits. The second part studies antigen-antibody reactions: (i) *in vivo* by cutaneous allergic reactions in immunized rabbits using *Ascaris* and *Taenia* extracts and in children parasitized by one genus or more, namely, *Ascaris*, *Trichocephalus*, *Enterobius*, *Taenia* or *Hymenolepis* or apparently free of parasites, using *Ascaris* antigen only; (ii) *in vitro* by precipitation and complement fixation. In rabbits reaction was positive in immunized animals, negative in controls. In children the *Ascaris* antigen gave positive reactions in all those parasitized, irrespective of the genus of parasite present, as well as in some apparently parasite-free patients. The *in vitro* tests showed the presence of antigen fractions which are common to both *Ascaris* and *Taenia* because the antigens reacted both with homologous and heterologous sera. The conclusion is reached that more refined methods using chemically purified and fractionated antigens, more sensitive antigen-antibody tests, etc., will have to be studied before satisfactory results can be hoped for. W.M.F.

102—Archives de Zoologie Expérimentale et Générale.

a. LUC, M. & CONINCK, L. A. P. DE, 1959.—"Nématodes libres marins de la région de Roscoff." **98** (2), 103–165.

(102a) Twenty-eight species of free-living marine nematodes, representing twenty-one genera, were collected at Roscoff, Brittany. One new genus and ten new species are described and figured. *Megeurystomina* n.g. is nearest to *Pareurystomina* but differs in the absence of caudal glands, in the shorter tail, in the much larger size (10 mm.) and more complex cephalic structure, and in the retractable head. *M. combesi* n.sp. is the type species. *Bolbella teisseri* n.sp. differs from the other species in the number of cervical setae and the development of the gubernaculum and pre-anal supplements. *Pareurystomina armorica* n.sp. is closely related to *P. typica* but the cephalic setae are shorter and the demanian values are greater. A key to the species of *Pareurystomina* is given. *Spirina gerlachi* n.sp. is characterized by large amphids, long tail and long somatic setae. *Chromaspirina parapontica* n.sp. is very close to *C. pontica* but differs in its smaller amphids, smaller two-part gubernaculum, longer cephalic setae and larger size. The genus *Chromaspirina* is discussed and a new combination formed, *C. pellucida* (Cobb, 1920) n.comb. for *Bolbolaimus pellucidus*. *Desmodora roscoffiensis* n.sp. is near *D. intermedia* but has subcephalic setae, longer cephalic setae and smaller amphids. *Axonolaimus drachi* n.sp. differs from *A. paraspinosus* by the presence of small setae at the base of the amphids, longer cephalic setae, longer tail and by the position of the excretory pore. *Odontophora wieseri* n.sp. is related to *O. furcata* but has much longer cephalic setae and shorter subcephalic setae. *O. villoti* n.sp. differs from the two previous species by equal cephalic and subcephalic setae one head diameter long. *Onchium parocellatum* n.sp. has a much shorter tail than *O. ocellatum*. Also thoroughly described and figured are: *Anticomopsis typicus*, *Anticoma acuminata*, *Oxystomatina filiformis*, *Eurystomina ornata*, *Symplocostoma tenuicolle*, *Spirina parasitifera*, *S. schneideri*, *Metachromadora suecica*, *Leptonemella aphanothecae*, *Desmodora serpentulus*, *D. schulzi*, *Croconema sphaericum*, *Monoposthia mediterranea*, *M. mirabilis*, *Ascolaimus elongatus*, *Axonolaimus setosus*, *Parabathylaimus denticaudatus* and *Metaraeolaimoides oxystoma*. R.W.T.

103—Arkiv för Zoologi.

a. MONNÉ, L., 1959.—"On the formation of the egg envelopes and the early development of the lungworms *Dictyocaulus viviparus*, *D. filaria*, and *Metastrongylus elongatus*." Series 2, **12** (2), 99–122.

b. MONNÉ, L., 1959.—"On the external cuticles of various helminths and their role in the host-parasite relationship. A histochemical study." Series 2, **12** (4), 343–358.

(103a) Using various histochemical and staining methods, Monné has studied the formation of the egg envelopes and the early development of *Dictyocaulus filaria*, *D. viviparus* and *Metastrongylus elongatus*. The egg membranes of *Dictyocaulus* are thin and consist of a Gram-positive, polyphenolquinone tanned protein associated with a polysaccharide which is intensely stainable by means of the periodic acid-Schiff technique. The membranes of the fertilized eggs of *Metastrongylus* consist of an external smooth layer with a granular internal layer and are subjected to de-lamination and re-lamination during their development; in addition to a polyphenolquinone tanned protein and associated polysaccharide they appear to contain an acid mucopolysaccharide. During the first cleavage division of the egg in both *Dictyocaulus* and *Metastrongylus* glycogen and ribonucleic acid accumulate chiefly in the blastomere AB, whilst fat is entirely transferred to the blastomere P. In early cleavage of *Metastrongylus* the mitochondria are equally distributed but they later appear to be broken down, to be metabolized as a yolk substance and to be replaced by newly-formed mitochondria. *Metastrongylus* larvae liberated by death and decay of the female worms whilst at an early stage enclosed by de-laminated fertilization membranes are capable of hatching in water, whereas larvae which are passed normally from the females and which are enclosed by thick shells formed from the re-laminated fertilization membranes can hatch only within the intermediate host. In somatic cells the nuclei become increasingly Feulgen positive during development and are strongly so in the larval stage. Large nuclei of adult somatic cells, however, are practically Feulgen negative whereas small nuclei are distinctly Feulgen positive. J.W.S.

(103b) Monné has studied the external cuticles of several species of trematodes, cestodes, nematodes and acanthocephalans by various "topochemical" and staining techniques. The external cuticle of cestodes and trematodes is soft and jelly-like in consistency and is composed of a thin external cuticular lamella and internal main cuticular layer. In all the cestodes examined, namely, *Moniezia expansa*, *Cittotaenia pectinata*, *Taenia taeniaeformis*, *Mesocestoides lineatus* and *Diphyllobothrium latum*, and in *Echinostoma revolutum* and *Paramphistomum cervi*, an acid mucopolysaccharide was found in both the main cuticular layer and external cuticular lamella. An acid mucopolysaccharide was found in the external cuticular layer of *Alaria alata* and on the surface of the cuticle in *Fasciola hepatica*; a non-acid, non-glycogen polysaccharide was found in the main cuticular layer of both species. A small amount of polyphenol seems to be associated with the external cuticular surface of these cestodes and trematodes and this, together with a mucopolysaccharide, is thought to inhibit the host's digestive enzymes. The external cuticles of both larval and adult nematodes and acanthocephalans are relatively strong elastic membranes consisting of proteins which are polyphenolquinone tanned and/or keratinized to resist, it is thought, the digestive action of host enzymes. J.W.S.

104—Arquivos do Museu Nacional. Rio de Janeiro.

a. FREITAS, J. F. TEIXEIRA DE, 1959.—"Estudos sôbre Schrankianidae fam.nov. (Nematoda, Subuluroidea)." **49**, 9–67.

(104a) Freitas treats Schrankiinae Skryabin & Shikhobalova, 1951 (emended to Schrankianinae nom.nov.) as a new family, Schrankianidae, of the Subuluroidea. The family contains one subfamily and two genera, *Schrankiana* Strand, 1942 and *Schrankianella* n.g. with *S. brasili* (Travassos, 1927) n.comb. as type species. The family is diagnosed as lacking a cuticular cephalic inflation and a vestibule, and as possessing a pharynx, a bulbed oesophagus and a simple intestine without diverticula. The female is viviparous, monodelphic, with a posterior vulva and the male has no caudal alae or pre-cloacal sucker. The genus *Schrankiana* contains four species, all of which are redescribed: *S. schranki* (Travassos, 1925) (type species), *S. larvata* (Vaz, 1933), *S. formosula* n.sp. from *Leptodactylus typhonius* in Brazil which is characterized by the corpus of the oesophagus not being divided into two regions, the distance of the vulva from the anus and the shape of the spicules and the gubernaculum, and *S. inconspicata* n.sp.

(=*S. schranki* of Fahel, 1952 and of Walton, 1953 non Travassos, 1925) which is similar to *S. schranki* but differs in the form of the tail in the female and in the shape of the spicules. *Schrankianella* n.g. contains only one species, *S. brasili* (Travassos, 1927), and is characterized by a relatively long oesophagus of which the metacorpus is very long and glandular, by a relatively long pharynx and by the excretory pore opening relatively far anterior to the posterior end of the oesophagus. W.G.I.

105—Avian Diseases. Ithaca.

a. FRAZIER, M. N., 1959.—"Field trials with hygromycin as an anthelmintic in poultry." **3** (4), 478–484.

(105a) In a controlled field trial involving over 100 White Leghorn chickens, 8 gm. hygromycin per ton of feed given for eight weeks reduced the rate of *Capillaria obsignata* infection from 100% to 5% and that of *Ascaridia galli* infection from 23% to 0%. In a second field trial 8 gm. hygromycin per ton of feed for 12 weeks increased egg production and decreased feed consumption compared with that seen in controls. In a third field trial 10 gm. hygromycin per ton of feed for eight weeks completely controlled *Heterakis gallinae* and partially controlled *C. obsignata* in 11 birds. J.W.S.

106—Biochimica et Biophysica Acta.

a. KIKUCHI, G., RAMIREZ, J. & BARRON, E. S. G., 1959.—"Electron transport system in *Ascaris lumbricoides*." **36** (2), 335–342.

(106a) Kikuchi *et al.* demonstrated the activities of cytochrome oxidase, DPNH (reduced diphosphopyridine nucleotide) oxidase, TPNH (reduced triphosphopyridine nucleotide) oxidase, cytochrome *c* reductase, and succinic dehydrogenase in particulate preparations from the muscle of *Ascaris lumbricoides*. They also found evidence of a cyanide- and Antimycin A-insensitive route of electron transport from DPNH, TPNH and succinic acid to oxygen. The possible importance of these systems in intact muscle of *Ascaris* is discussed. W.P.R.

107—Biológico. São Paulo.

a. CARVALHO, J. C., 1959.—"O nematóide cavernícola e o seu aparecimento em São Paulo." **25** (9), 195–198.

(107a) *Radopholus similis* was found on banana in São Paulo. This is the first record of this nematode in Brazil. R.D.W.

108—Blood. New York.

a. LAYRISSE, M., BLUMENFELD, N., DUGARTE, I. & ROCHE, M., 1959.—"Vitamin B_{12} and folic acid metabolism in hookworm-infected patients." **14** (12), 1269–1279.

(108a) Many Venezuelan patients with severe hookworm anaemia often had malabsorption of folic acid and a diminution in serum vitamin B_{12} concentration, which in some cases fell below 100 $\mu\mu$gm. per ml. of serum. 12 of 13 of those severely affected also showed impairment of the pteroylglutamic acid intestinal absorption but none exhibited megaloblastic proliferation in the bone marrow and all recovered after iron therapy alone. R.T.L.

109—Boletim do Instituto Biológico da Bahia.

a. ARAÚJO BASTOS, W. D. DE, 1959.—"Ovos de *Schistosoma mansoni* em fézes de suino (*Sus scrofa*) na Bahia, Brasil. (Nota prévia)." Years 1957–59, **4** (1), 34–36.

(109a) Eggs of *Schistosoma mansoni* which were immature or contained a dead miracidium were found in eight of 1,000 faecal samples of pigs collected at the abattoir of Salvador (Brazil). N.J.

110—Boletín de la Asociación Médica de Puerto Rico.

a. MALDONADO, J. F. & OLIVER-GONZALEZ, J., 1959.—"The prevalence of intestinal parasitism in certain areas of Puerto Rico—a 3-year study." **51** (4), 109–124.
b. PARAVISSINI, F., OLIVER-GONZALEZ, J. & MALDONADO, J. F., 1959.—"Treatment of massive *Trichuris trichiura* infections with Telmid." **51** (4), 135–137.
c. MALDONADO, J. F., 1959.—"The host parasite relationships in schistosomiasis mansoni." **51** (7), 228–237.
d. VALCARCEL, M. I. & RAMOS-OLLER, A., 1959.—"Surgical complications of ascariasis." **51** (9), 313–319.
e. MALDONADO, J. F., 1959.—"The daily emergence of the cercaria of *Schistosoma mansoni*." **51** (9), 336–339.
f. CORDERO, R. & KOPPISCH, E., 1959.—"Segundo caso de cisticercosis intracraneana en Puerto Rico; operación y curso postoperatorio." **51** (11), 403–414.

(110a) Examination of 23,262 faecal samples collected between 1953 and 1955 from six localities in Puerto Rico, representing three different physiographical areas of the island, revealed over-all infections of approximately 80% with *Trichuris*, 31% with *Ascaris*, 27% with hookworm and 5% with *Strongyloides stercoralis*. The prevalence of each infection in each area for the three years and the over-all prevalence by age and sex of each infection is given in tabular form. The worm burden of *Trichuris* measured during the last year was usually from six to 31 worms, although 12% had more than 600 worms; that of *Ascaris* varied from two to 25 with 14·5% of cases harbouring more than 20 worms. Several aspects of the epidemiology of the parasites are discussed. The greater prevalence of *Trichuris* compared with *Ascaris* in areas of high soil moisture reported in surveys elsewhere was not seen here. Hookworm infection, once an occupational hazard, is now becoming a door-yard problem. J.W.S.

(110b) 32 children with heavy infections of *Trichuris trichiura*, whose ages ranged from 20 months to ten years, were treated with daily doses of 20 mg. dithiazanine iodide per pound body-weight for five days with a maximum of 600 mg. in any one day. Within 22 days the faecal egg counts of 30 cases became negative, the two other cases showing much reduced egg counts. Nausea and vomiting in ten children subsided after treatment. J.W.S.

(110c) Maldonado reviews published work on the host-parasite relationships in schistosomiasis mansoni of man and laboratory animals. Unpublished data of the author indicate that the quality of dietary protein and the calorific intake are among the extrinsic factors bearing on the death or survival of a host infected with schistosomiasis. Folic acid and pyridoxine may be required for the development of the adult worm. That some individuals can tolerate a heavy infection whereas others with an apparently light infection develop severe symptoms leads the author to speculate that these latter individuals possess a "parasitosis prone" gene that may become manifested earlier or later in life. J.W.S.

(110e) Using a technique for the recovery of cercariae from large volumes of water essentially that described by Rowan [for abstract see Helm. Abs., **27**, No. 80g] Maldonado found that in a concrete pond in the Rio Piedras area of San Juan, Puerto Rico, *Schistosoma mansoni* cercariae emerged from *Australorbis glabratus* during the daytime and accumulated until approximately 6.00 p.m., after which time the numbers decreased. Light intensity did not appear to affect cercarial emergence. Each snail shed approximately 500 cercariae per day. The life-span of cercariae, calculated to be about ten hours, appeared to be shortened with increase in water temperature. J.W.S.

111—Boletín Venezolano de Laboratorio Clínico.

a. ANDERSON, R. C. & DÍAZ-UNGRÍA, C., 1959.—"Nematodes de Venezuela, VI. *Dirofilaria striata* (Molin, 1858), Railliet y Henry, 1911, en felinos suramericanos, con comentarios sobre las *Dirofilaria* en carnívoros." **4** (1/4), 3–15. [English summary p. 14.]

(111a) Anderson & Díaz-Ungría have given a detailed description of specimens from the subcutaneous tissues of *Felis pardalis* and *F. tigrina* which they identified as *Dirofilaria striata*. They have reviewed the descriptions of species of *Dirofilaria* of carnivores and have constructed a table giving the principal measurements of *D. stricta*, *D. sudanensis*, *D. granulosa*, *D. genettae*, *D. pagumae*, *D. minor*, *D. tenuis*, *D. ursi* and *D. repens*. A host list is provided. They have studied specimens of *D. repens* originally identified by Railliet & Henry and have redescribed the species. The authors suggest that there is a possibility that *D. repens*, *D. sudanensis*, *D. granulosa*, *D. genettae*, *D. pagumae* and *D. minor* are synonymous and that further study is needed, particularly as the original descriptions seem to be inaccurate. H.D.C.

112—Bragantia. Campinas.

a. BOOCK, O. J., 1959.—"Influência da adubação e da fumigação do solo, na incidência de nematóides em tubérculos de batatinha." **18** (22), 327–335. [English summary p. 334.]

(112a) The author concludes from field experiments that fertilizer has no influence on infestation of potato tubers by *Meloidogyne incognita* or *Pratylenchus steineri*. Fumigation with EDB gave a good yield increase and reduced nematode infestation. J.E.P.

113—Bulletin de l'Académie Vétérinaire de France.

a. GUILHON, J. & PETIT, J. P., 1959.—"Essai de traitement de la syngamose des faisandeaux par des préparations anthelminthiques administrées sous forme d'aérosols." **32** (6), 369–372.
b. GUILHON, J. & JOLIVET, G., 1959.—"Recherches sur la toxicité et les propriétés anthelminthiques de la dithiazanine." **32** (7), 413–419.
c. STEFAŃSKI, W. & PRZYJALKOWSKI, Z., 1959.—"Recherches sur les propriétés antibiotiques des larves de nématodes parasites." **32** (8), 495–497. [Discussion pp. 497–498.]

(113a) Young pheasants three to five weeks old, naturally infected with four to six pairs of *Syngamus* and showing clinical symptoms, were used to test two anthelmintic mixtures converted into an aerosol (particles of 1μ to 5μ). In the first experiment the mixture consisted of essential aromatic oils with a phenol base plus 20 parts per thousand of pyrethrum oil and roteno-resin. The birds were placed in a hermetically sealed crate of 3·8 cu.m. capacity and exposed for four hours on three consecutive days to increasing doses (27·6 ml. to 34·2 ml. per cu.m.). In the second experiment the mixture consisted of essential oils as before plus 30 parts per thousand of pyrethrum oil and roteno-resin and 20 parts per thousand of chenopodium oil. Only one treatment lasting 15 minutes was given; the atmosphere in the crate contained 120 ml. of the mixture produced as an aerosol at the rate of 8 ml. a minute. The results showed that the first mixture relieved symptoms for about six days but is inadequate; the second mixture, however, is very effective and produces a permanent cure but must be used with care because of the danger of asphyxia during exposure to the aerosol. W.M.F.

(113b) Dithiazanine (iodide of 3-3′diethylthiadicarbocyanine) was given to eight dogs infected with *Trichuris* and ancylostomes, five pigeons infected with *Ascaridia* and *Capillaria* and to six mice, five rats, two pigs, one sheep and one rabbit, all free of parasites. The dogs received 12 to 20 mg. per kg. body-weight in pill form daily for three to seven days in one or three doses per day. In seven dogs tolerance was poor, all showed anorexia, debility and diarrhoea and one died. The eighth dog, receiving 20 mg. per kg. body-weight in single daily doses for five days, showed good tolerance with diarrhoea only. Some activity against *Trichuris* was noted; observations of the action on ancylostomes were inconclusive but not negligible. Pigeons received 200 mg. per kg. body-weight in one dose. One died within a few hours, another five days later after showing enteritis; in both, *Ascaridia* and *Capillaria* present were unaffected. A bird infected exclusively with *Capillaria* tolerated the drug well and its faeces were negative for eggs after four days. Six mice received daily doses of the powdered drug at the rate of 20, 30 and 50 mg. per kg. body-weight. All died with gastritis and enteritis between the second and fifth day. Rats given 20 mg. per kg. body-weight for four consecutive days tolerated the drug well. One pig was given 20 mg. per kg. body-weight once and died after developing diarrhoea. Another was given 20 mg. per kg. for five consecutive days followed

after an interval of four days by 30 mg. per kg. for three consecutive days and survived. One sheep and one rabbit received 30 mg. per kg. body-weight for five consecutive days and tolerated the drug well. W.M.F.

(113c) *In vitro* experiments designed to examine the hypothesis that the phenomenon of the rarity of penetration of the intestinal wall or the skin by bacteria as a result of nematode larval migrations is due to an antagonistic or antibiotic secretion produced by the larvae are described. Infective larvae of *Ascaris*, *Strongyloides*, a wide variety of strongyloid nematodes and 18 species of pathogenic and facultatively pathogenic bacteria were used. Washed larvae, both living and aseptically triturated, failed to inhibit the growth of the bacteria on culture media, thus disproving the hypothesis. Another explanation for the phenomenon is put forward; it is that the invasion of microbes through the intestinal mucosa is opposed by defence mechanisms elaborated in the course of evolution during the period of coexistence in the host of a well-defined bacterial flora and parasitic nematodes. This would probably explain why microbes penetrate more easily with larvae through the skin—a region where the contact between helminth larvae and germs is rarer and where, as a result, the powers of resistance are not elaborated to such a degree of efficiency as in the intestinal wall. W.M.F.

114—Bulletin of the Azabu Veterinary College, Japan.

a. ITAGAKI, H. & AKANE, S., 1959.—"Morphological study on the Japanese liver fluke, compared with the African specimens." No. 6, pp. 115–123. [Japanese summary p. 123.]

(114a) Differences are observable between eggs, spines and shape of the adults of *Fasciola hepatica* from Europe, *F. gigantica* from Africa and *F. indica* from India, but these variations also occur in specimens of the liver-fluke collected from cattle in Japan and scarcely justify their specific separation. R.T.L.

115—Bulletin of the Calcutta School of Tropical Medicine.

a. CHAKRAVARTI, R. N. & ADHYA, R. N., 1959.—"Preparation of 1-bromo-2-naphthol." **7** (4), 144–145.
b. BHADURI, N. V. & BANDYOPADHYAY, A. K., 1959.—"Filarial incidence in a prison population." **7** (4), 151–152.
c. BHADURI, N. V. ET AL., 1959.—" 'Alcopar' in ascariasis: preliminary observations." **7** (4), 154.
d. THOMPSON, P. E., 1959.—"Recent developments in the chemotherapy of parasitic infections." **7** (4), 186–190.

116—Bulletin de la Société Médicale d'Afrique Noire de Langue Française.

a. CARAYON, A., COLLOMB, H. & SANKALE, M., 1959.—"Du polymorphisme des complications neuro-psychiques des filarioses (à propos de quatre observations personnelles dont deux inédites)." **4** (3), 299–312.
b. LARIVIÈRE, M., CORREA, P. & LAUROY, J., 1959.—"A propos de deux cas de cervicite bilharzienne." **4** (3), 313–316.
c. BA, A., CAMAIN, R. & QUENUM, C., 1959.—"A propos d'une tumeur bilharzienne de la vulve." **4** (4), 432–434.

117—Bulletin of the World Health Organization.

a. WALTON, B. C. & CHYU, I., 1959.—"Clonorchiasis and paragonimiasis in the Republic of Korea. Report on a prevalence survey using intradermal tests." **21** (6), 721–726. [French summary p. 726.]
b. CROSSKEY, R. W., 1959.—"Aspects of black-fly control and entomology in the New World in relation to the *Simulium* problem in Nigeria." **21** (6), 727–736. [French summary p. 735.]
c. WILLIAMS, E. R., 1959.—"Molluscicide-dosage computer for bilharziasis control." **21** (6), 784–785.

(117a) Using antigens of *Paragonimus westermani* and *Clonorchis sinensis*, Walton & Chyu have carried out intradermal tests on nearly 10,000 persons in the Republic of Korea. The results according to age, sex and province are tabulated. The highest incidence of clonorchiasis was found in the province of Kyong Sang Puk To where 53% of males and 14% of females

were positive; the lowest incidence was in Cheju Do where 3% of males and 1% of females were positive. The higher incidence of clonorchiasis among males than among females may be related to the social custom of drinking rice wine traditionally accompanied by raw fish in which women indulge only infrequently. The highest over-all incidence of paragonimiasis was 47% in Cheju Do and the lowest was 3% in Kyonggi Do; the rate of infection of males was higher than that of females in all provinces. In a discussion of the possible sources of *Paragonimus* infection, mention is made of the traditional treatment of measles in children by the application of the liquor of crushed raw crayfish. It is estimated that in South Korea there are about 4·5 million cases of clonorchiasis and up to 1·5 million cases of paragonimiasis. J.W.S.

(117b) The control of (i) *Simulium venustum* and *Prosimulium hirtipes* in the Baie Comeau area of Quebec Province, Canada, and in the Adirondack Mountains of New York State, U.S.A., (ii) *S. ochraceum*, *S. metallicum* and *S. callidum* in the States of Oaxaca and Chiapas, Mexico, (iii) *S. arcticum* on the North and South Saskatchewan rivers near Saskatoon, Canada, and (iv) *S. damnosum* in Northern Nigeria, are shown to present different problems and to require, consequently, different control procedures. Whereas a number of biological observations have been made on the black-flies of Canada, some of which are described here, little is known of the biology of *S. damnosum*. A table, compiled of data from published work by Crosskey and various other authors, compares the features of onchocerciasis in Mexico and Guatemala with those in Nigeria. It is suggested that the control of onchocerciasis by the large-scale excision of nodules, as practised in Mexico and Guatemala where as many as 70% to 80% of infected persons may show palpable nodules, would have little effect on the numbers of microfilariae available for transmission in Nigeria where only 10% to 15% of infected persons show superficial nodules. J.W.S.

(117c) Williams describes a pocket-size computer, judged satisfactory following three years of field testing in Puerto Rico, for use in determining the number of one-ounce sodium pentachlorophenate briquettes required to dose small ponds and still sections of streams at a minimum dosage of 10 p.p.m. J.W.S.

118—Cahiers de Médecine Vétérinaire.

a. EUZÉBY, J. & BUSSIÉRAS, J., 1959.—"Les perturbations métaboliques d'origine verminеuse." **28** (4), 117–135.
b. GRABER, M., 1959.—"Action ténifuge chez l'homme et chez les mammifères domestiques de quelques dérivés de l'acridine." **28** (6), 181–195.

(118a) Euzéby & Bussiéras review our knowledge of the effect of helminth parasites on host metabolism. Their presence results in a diminished absorption by the host of nutriment eaten and inefficient use of what is absorbed. Interference with the metabolism of proteins results in a disturbance of serum protein levels and consequent oedemata. Interference with the metabolism of sugars results from selective absorption by the parasites and from hyperguandinaemia and hypersecretion of insulin brought about by toxins from the parasites. Mineral and vitamin metabolism is upset by the absorption by helminths of large quantities of phosphorus, calcium and iron and by their inhibiting effect on the absorption of vitamins by the host resulting in clinical or subclinical deficiencies. W.M.F.

(118b) Graber reviews the literature on the taeniafuge action of acridine derivatives. After a preliminary discussion on the action of aminoacridine as studied by Russian workers he goes on to consider in more detail the properties of quinacrine and gonacrine, and gives a brief consideration to acranyl. In the case of quinacrine [synonyms mepacrine, atabrine, etc.] and in the case of gonacrine [synonyms trypaflavine, acriflavine, etc.] he reviews the literature on action, dosage, efficacy and toxicity in man and animals for the former and reports on his own work with sheep using both. He concludes that the margin between the therapeutic dose and the lethal dose of gonacrine is not sufficiently wide to merit its use in sheep. W.M.F.

119—Calcutta Medical Journal.

a. GHOSH, P. K., 1959.—"Disseminated hydatid disease of abdomen." **56** (2), 55–58.

120—Canadian Journal of Microbiology.

a. LABZOFFSKY, N. A., KUITUNEN, E., MORRISSEY, L. P. & HAMVAS, J. J., 1959.—"Studies on the antigenic structure of *Trichinella spiralis* larvae." **5** (4), 395–403.

(120a) Seven different antigenic fractions were isolated from larvae of *Trichinella spiralis* by chemical and physical means. In rabbits infected with *T. spiralis* the authors found that antibodies to these various fractions developed at different times during the infection and stress the importance of using properly selected antigen for the diagnosis of trichinelliasis on a serological basis according to the state of the infection. E.J.L.S.

121—Central African Journal of Medicine.

a. KIRK, R., 1959.—"African onchocerciasis." **5** (5), 233–242.
b. ALVES, W., 1959.—"Further studies on antimony dimercapto succinate (TWSb) in urinary bilharziasis." **5** (6), 291.

(121a) Kirk reviews the literature on African onchocerciasis in respect of its distribution, the biology and control of *Simulium*, the possible existence of an animal reservoir host, the clinical features of the disease and its treatment. There are 87 references. J.W.S.

(121b) 46 African males, 17 to 21 years of age, were treated for urinary schistosomiasis with 0·5 gm. of antimony dimercaptosuccinate (TWSb) daily for three consecutive days; 20 patients were injected intravenously while 26 were injected intramuscularly. 43 patients were negative for eggs in the urine during a follow-up of three months after treatment whilst two, one in the intravenous group and the other in the intramuscular group, were positive throughout and one in the intravenous group again became positive about five weeks after treatment. Three patients in the intravenous group complained of excessive salivation and seven of the intramuscular group complained of pain at the site of injection. J.W.S.

122—Československá Epidemiologie, Mikrobiologie, Imunologie.

a. LÝSEK, H., 1959.—"Příspěvek k úloze půdy a zeleniny v epidemiologii geohelmintóz." **8** (2), 137–140. [English & Russian summaries pp. 139–140.]
b. PROKOPIČ, J., 1959.—"K problému diagnostiky trichinelózy u volně žijících savců." **8** (3), 202–207. [English & Russian summaries pp. 206–207.]

(122a) Garden soil, fertilized with untreated manure once or twice a year outside the vegetative period, contained ten to 3,160 geohelminth eggs per kg. 29 samples of carrots, parsley and cucumbers had no eggs adhering to them after washing with 200 ml. to 400 ml. of water. Eggs were found on nine other samples, grown in soil containing 80 to 120 eggs per kg. and wiped with a dry cloth. No eggs were found on nine control samples which were simply rinsed in water. N.J.

(122b) Compressing, digestive and histochemical methods were used in examinations of 1,917 wild and domestic mammals for trichinelliasis in Czechoslovakia. One type of nematode larva was found in the muscle in seven *Sorex araneus* and in two *S. alpinus*, another type in three *Putorius putorius* and one *Mustela nivalis*. Both belong probably to Spiruroidea and the second type resembles *Physaloptera*, but neither type was that of *Trichinella spiralis*. Attempts to obtain adults by infecting guinea-pigs and rabbits failed. The author points out that it is difficult to diagnose nematodes from muscles by the compression method and suggests that such diagnoses made by some previous authors should have been experimentally confirmed. N.J.

123—Clinica Veterinaria. Milan.

a. MANDELLI, G. & GRIMALDI, E., 1959.—"Osservazioni sulle lesioni da *Diphyllobothrium latum* in pesce persico (*Perca fluviatilis* L.) e luccio (*Esox lucius* L.)." **82** (2), 33–38. [English summary p. 38.]

b. MANDELLI, G., 1959.—"Lesioni bronco-polmonari da elminti nei camosci (*Rupicapra rupicapra* L.) e negli stambecchi (*Capra ibex* L.) del Parco Nazionale del Gran Paradiso. Reperti anatomoistologici e considerazioni patogenetiche." **82** (7), 225–248. [English summary p. 247.]

c. MORETTINI, B., 1959.—"L'adipato di piperazina nel trattamento della ascaridiosi del vitello." **82** (9), 315–319.

(123a) *Diphyllobothrium latum* plerocercoids were found in 28 out of 60 *Perca fluviatilis* and 7 out of 10 *Esox lucius* from the lake of Varese. The authors describe the histopathological lesions caused by the larvae during their migration and note the presence of a whitish sub-peritoneal nodule at the point of entry of the procercoid larva into the gastric wall of one pike. N.J.

(123b) Mandelli gives a detailed and figured description of anatomo-pathological lesions caused by lungworms in nine *Capra ibex* and 12 *Rupicapra rupicapra* from the Parco Nazionale del Gran Paradiso (Aosta). *Muellerius capillaris* was the prevalent infection. In those animals of under one year of age the prevalent lesions were exudative while in the older ones there were granulomatous nodules and in the most heavily infected a muscular hypertrophy of the bronchioles produced chronic alveolar emphysema. N.J.

(123c) A single dose of 290 mg. to 800 mg. of piperazine adipate per kg. body-weight completely cured 180 of 200 calves of ascarid infection. The other 20 were freed from the parasites and morbid symptoms by repeating the treatment. N.J.

124—Comptes Rendus de l'Académie Bulgare des Sciences.

a. VASILEV, I., 1959.—[The goat (*Capra hircus*) as host of *Neoascaris vitulorum* (Goeze, 1782) Travassos, 1927.] **12** (6), 597–600. [In Russian: English summary p. 600.]

(124a) *Neoascaris vitulorum* eggs were given to three kids; larvae were found in the liver, lungs and kidneys of one killed on the ninth day after exposure and one larva in the lungs of the kid killed on the 16th day. No ascarids were found in the kid killed on the 13th day or in the digestive tract of any of the kids. 18 *N. vitulorum* were found in the intestine of a kid on the 26th day after birth as a result of administration of infective eggs to its mother during pregnancy. An attempt to infect another kid failed. It is concluded that the goat should be considered as a facultative host of *N. vitulorum* and that the infection is intra-uterine. N.J.

125—Deutsche Medizinische Wochenschrift.

a. HARNACK, G. A. VON, 1959.—"Bandwurmbehandlung im Kindesalter mit Cestodin." **84** (18), 865–866. [English summary p. 896.]

(125a) 31 children were treated for taeniasis (chiefly *Taenia saginata*) with Cestodin, containing metallic tin, tin oxide and tin chloride [given as zinc in the English summary] in the recommended doses of one tablet three times daily for children aged over 12 years, one tablet twice daily for those aged 8 to 12 years and half a tablet twice daily for those under eight years. Carlsbad salt or magnesium sulphate was given a day before and during the five-day treatment; if necessary the treatment can be extended to seven days. Of the 27 children followed up, 25 were cured by a single treatment and two by a repeat treatment. A child was taken as cured when no further proglottides were passed after two to four months. Vomiting occurred in only one child and in two transient abdominal pains which, however, had also been present before the treatment. Thus Cestodin has proved itself highly effective and also well tolerated by children. G.I.P.

126—Down to Earth. Midland, Michigan.

a. SHAVER, R. J. & LANDRAM, J. F., 1959.—"Progress report on Ruelene, a new anthelmintic." **15** (1), 7–9.

127—Ecology.

a. PIMENTEL, D. & WHITE, Jr., P. C., 1959.—"Physiochemical environment of *Australorbis glabratus*, the snail intermediate host of *Schistosoma mansoni* in Puerto Rico." **40** (4), 533–541.
b. PIMENTEL, D. & WHITE, Jr., P. C., 1959.—"Biological environment and habits of *Australorbis glabratus*." **40** (4), 541–550.
c. COLLIS-GEORGE, N., 1959.—"The physical environment of soil animals." **40** (4), 550–557.

(127a) Pimentel & White have studied the effects of shade, turbidity, water velocity, stream gradient, type of bottom and water depth on the distribution of *Australorbis glabratus* along the entire length of a tributary of the Quebrada Sabana Llana, Puerto Rico. These factors together with those of water temperature, electrolyte content, alkalinity, *p*H, topography, profile of stream channel, permanence of water and the effect of flushing were also studied in many smaller bodies of water distributed over the island. Snail abundance was inversely related to the degree of shading, stream velocity and, possibly, to the stream gradient. Viability was apparently unaffected by turbidity. Snails were found at no depth greater than 3·5 feet, were found in water with an average temperature of 26·7°C. within a range of from 21°C. to 37°C. and were not directly affected by the type of bottom. They were present in streams with alluvial watersheds but not in streams with watersheds of steep-sloped barren hills where run off rates and flushing action were high. Shallow streams U-shaped in cross section were more suited for *A. glabratus* than were deep V-shaped stream channels. Temporary water was not inhabited. The osmoregulatory system of the snails was not well adapted to rapid changes in electrolyte content of the water and these changes usually resulted in a burst of viable egg laying. No significant differences were seen in the *p*H, carbon dioxide content or conductivity of water from habitats with and without *A. glabratus*. J.W.S.

(127b) Pimentel & White have compared the flora and fauna of the same tributary of the Quebrada Sabana Llana (Puerto Rico) containing *Australorbis glabratus* as used in a previous study [see abstract No. 127a above] with that of a tributary of the Quebrada Maracuta from a different physiographic area of the island which does not contain *A. glabratus*. Various smaller bodies of water distributed over the island were similarly studied and several observations were made on the behaviour of *A. glabratus*. *Ampullaria* sp. and *Marisa cornuarietis*, which were recently introduced into Puerto Rico, will probably not markedly affect the abundance and distribution of *A. glabratus*. The presence of *Nitella* sp., *Najas guadalupensis*, *Piaropus crassipes*, *Ceratophyllum demersum* and *Commelina* sp., and the presence of *Physa cubensis*, *Lymnaea* spp. and *Drepanotrema anatinum* in a stream indicated the presence of *A. glabratus* at odds greater than 3: 1 and 1: 1 respectively. It is not known to what extent these three last-named snail species compete with *A. glabratus*. When *Tropicorbis decipiens*, *Neritina* sp., Tubificida, simuliid larvae and trichopteran larval cases attached to stones were present, *A. glabratus* was generally absent. Removal of the vegetation from one stream caused a heavy reduction in *A. glabratus*. Only a small percentage of *A. glabratus* were naturally infected with *Schistosoma mansoni*. In laboratory tests, the rate of movement of snails 10 mm. in diameter was 5 cm. per minute and for snails 20 mm. in diameter was 12·5 cm. per minute. Although the snails could move faster than the water receded after flooding, many were left stranded on stream banks with slopes of 20° or less and were killed by rats or ants; they were apparently unable to detect or respond to water level changes. In the laboratory, some snails resisted desiccation by aestivating for up to four months but none actively burrowed into mud. The vertical migration of *A. glabratus* from deep in the water during daytime to the surface at night seen in the field was confirmed in the laboratory. J.W.S.

(127c) Collis-George discusses the physical environment of soil animals and, when dealing with nematodes, refers to the work of Jones (1950), Wallace (1955 and 1956) and Collis-George & Blake (1959) [for abstracts see Helm. Abs., **19**, No. 278a; **24**, No. 248b; **26**, No. 56d; and **29**, No. 248 respectively]. J.W.S.

128—Folia Veterinaria. Košice.

a. HOVORKA, J., 1959.—"Príspevok k štúdiu sezónnosti telazíozy hovädzieho dobytka v ČSR." **3** (1/2), 237–249. [English, German & Russian summaries pp. 245–249.]

b. BREZA, M., 1959.—"K ekologickým vztahom dážďoviek (Lumbricidae) ako medzihostitelov pneumohelmintov ošípaných z rodu *Metastrongylus*. 1. Nový vnímavý druh medzihostitelov—*Eisenia veneta* (Rosa) var. *hortensis* (Mich.)." **3** (1/2), 251–266. [English, German & Russian summaries pp. 264–266.]

c. JURÁŠEK, V., 1959.—"K faune parazitických červov diviaka na Slovensku II." **3** (1/2), 267–281. [English, German & Russian summaries pp. 280–281.]

d. BERECKÝ, I., SOKOL, J. & VODRÁŽKA, J., 1959.—"Sledovanie účinnosti dietylkarbamazínu (hetrazánu) u oviec zamorených dikrocéliami." **3** (1/2), 303–308. [English, German & Russian summaries pp. 307–308.]

(128a) Dissection of eyes from 2,621 cattle from the Carpathian region of Czechoslovakia carried out during 1954–58, showed the presence of *Thelazia* spp. in 723 animals. *T. rhodesii* was found in 606, *T. skrjabini* in 161 and *T. gulosa* in 91 cattle. The highest incidence of *T. rhodesii* was observed in November and the lowest in June, when juveniles were found. Juveniles of the other two species were observed from July to December. The incidence of *T. rhodesii* was highest in the forest-steppe and lowest in the mountainous zone and increased with the age of the animals up to 10 years; the degree of infection was also higher in older animals. 92·1% of 2,216 clinical cases of kerato-conjunctivitis occurred during the grazing season, mainly from July to September, which corresponded with the finding of juvenile *Thelazia*. 100 ml. of 0·5 parts per thousand Lugol's solution, applied through the ductus lachrymalis, was effective as an anthelmintic while treatment of symptoms was successfully carried out with penicillin and sulphonamide ointments, acridine dyes, etc. Starting at the beginning of the grazing period, smearing repellent ointments around the eye was a useful prophylactic measure. N.J.

(128b) *Eisenia veneta* var. *hortensis*, hitherto unknown in Czechoslovakia, is reported for the first time as an intermediate host of *Metastrongylus*. This earthworm was found at a small pig breeding farm, where *M. elongatus* and *M. pudendotectus* infections were observed. At two successive examinations made in August and October, two out of six and 28 out of 44 earthworms were found infected respectively [as can be concluded from the tables]. At the same farm *Allolobophora chlorotica*, *A. caliginosa*, *Bimatus tenuis* and *Eisenia foetida* were also infected to various degrees with *Metastrongylus* larvae. Of these *A. chlorotica* was the most frequently infected (over 90%). The author discusses the role of the different earthworms as intermediate hosts of *Metastrongylus*. N.J.

(128c) Autopsy of 20 wild boars in Slovakia showed the presence of 11 helminth species, of which *Echinococcus granulosus*, found in one of the animals, is reported for the first time from Czechoslovakia. N.J.

(128d) Hetrazan was given *per os* to eight sheep with dicrocoeliasis in three successive doses of 1 gm. per kg. body-weight at two-day intervals. No side effects were observed. Seven other sheep received the drug intravenously as a 25% solution in a single injection: two sheep received 0·1 gm. per kg., three received 0·5 gm. per kg. and the remaining two received 0·25 gm. per kg. One of the sheep that received 0·1 gm. per kg. and one of those that received 0·5 gm. per kg. died immediately. In this group repeated spasms followed by apathy were observed as side effects. Faecal examinations showed that hetrazan had no therapeutic effect. Autopsy of one sheep treated orally and of two treated intravenously, all of which died four to five weeks after treatment, showed numerous motile *Dicrocoelium*. N.J.

129—Gastroenterology. Baltimore.

a. SCHREIBER, W., 1959.—"Introduodenal therapy for *Tenia*, hookworm and *Strongyloides* infection." **37** (3), 346–349.

(129a) Very promising results were obtained in the treatment of cases of *Taenia saginata*, *Necator americanus* and *Strongyloides* by intraduodenal administration through a Miller-

Abbott tube. A liquid diet was given for two days, followed by one ounce of magnesium sulphate and on the morning of the third day the patient received secobarbital for sedation and atropine ($^1/_{150}$ grain) to reduce salivation and to reduce pyloric tone. When the tube was introduced, X-ray observation ensured that its tip was in the middle part of the duodenum so that all its perforations were in the duodenum. After the anthelmintic was administered the tube was removed and a purge of magnesium sulphate was given. For *T. saginata* atebrin (1 gm. in 100 c.c. of water) was successful in 32 patients. 100 out of 124 *N. americanus* patients were successfully treated with 4 c.c. of tetrachlorethylene and the 24 failures were successfully retreated. 31 patients with *Strongyloides* infection were given 25 c.c. of a 1% aqueous solution of gentian violet which was initially effective in 100% but recurrence was found in three out of 17 re-examined four months later. Eight other patients were given 30 c.c. of a 1% aqueous solution of atebrin; five of the six who returned after three months for follow up examination failed to reveal any infection. R.T.L.

130—Helminthologia. Bratislava.

a. BARANOVSKAYA, I., 1959.—[Causal analysis of the nematode fauna of Gramineae.] **1** (1/4), 13–20. [In Russian: English & German summaries p. 20.]

b. BIROVÁ-VOLOSINOVIČOVÁ, V., 1959.—"Die Pute (*Meleagris gallopavo dom.* L.)—ein neuer Helminthenwirt aus der Klasse Nematoda." **1** (1/4), 21–30. [English & Russian summaries pp. 29–30.]

c. DAVIDOVA, I., 1959.—[*Calicophoron* spp. in ruminants in the U.S.S.R.] **1** (1/4), 31–36. [In Russian: English & German summaries p. 36.]

d. MITUCH, J., 1959.—"Ein neuer Trematode *Lecithodendrium* (*Lecithodendrium*) *hovorkai* sp.nov., isoliert aus Fledermäusen der Familie Vespertilionidae in der ČSR." **1** (1/4), 37–41. [English & Russian summaries pp. 39–41.]

(130a) An analysis of the nematode fauna of Gramineae was made in the Moscow region by regular examination of the same sites every ten days throughout a vegetative period. The dynamics of this fauna, taking into account the complex of species, were found to depend on the temperature, humidity, a range of biotic factors, duration of vegetation, presence of fungal diseases, intra- and inter-specific relationships between the nematodes and biological peculiarities of the soil. The numbers of nematode species found were 60 in *Secale cereale*, 49 in *Triticum vulgare*, 52 in *Avena sativa*, 43 in *Zea mays*, 34 in *Phleum pratense*, 26 in *Bromus inermis* and 21 in *Festuca pratensis*. It is mentioned *inter alia* that 37 nematode species were found in *Trifolium sativum*. The nematode fauna of oats growing on sandy soil was qualitatively and quantitatively richer than that of oats on sub-clay, gleyish soil. N.J.

(130b) *Ganguleterakis dispar*, *Capillaria bursata* and *Thominx phasianina* are reported from turkeys in Slovakia. All three are new host records. The morphology and measurements of these specimens are compared with previous descriptions from other hosts. G.I.P.

(130c) *Calicophoron calicophorum* and *C. erschowi* n.sp. are described and figured from cattle in Azerbaidzhan and, the latter, also from the Primorsk region of the U.S.S.R. *C. erschowi* differs from *C. calicophorum*, *C. microon* and *C. raja* in having cuticular papillae on the anterior part of the body and from *C. cauliorchis*, *C. crassum* and *C. papillosum* in the length of the body (13 to 18 mm.), the large, densely set vitelline follicles which start at the bifurcation of the intestine and in the ratio of the lengths of the ventral sucker and body which is 1 : 4·5 to 6·3. The new species is nearest to *C. ijimi* which, however, has a characteristic pharynx structure. *Paramphistomum skrjabini* is considered to be a synonym of *C. calicophorum*. G.I.P.

(130d) *Lecithodendrium* (*Lecithodendrium*) *hovorkai* n.sp. was found in five bats in Czechoslovakia, 143 specimens in *Eptesicus nilssoni* and one each in *E. serotinus* and *Myotis mystacinus*. The new species is pear-shaped and 1·03 to 1·45 mm. in length. It differs from the nearest species, *L.* (*L.*) *macrostomum*, in the smooth cuticle, the larger ventral sucker (112 to 146μ), the position of the genital organs, and the rounded bursa which is 115 to 160μ in size [112 to 150μ in table] and lies immediately below the intestinal bifurcation. The intestinal caeca are 52μ long and 33μ wide and the compact uterus gives an indication of lobes and fills the whole posterior half of the body. G.I.P.

130—Helminthologia. Bratislava. (cont.)

e. MYUGE, S., 1959.—[Development of parasitism in plant nematodes.] **1** (1/4), 43–50. [In Russian: English & German summaries pp. 49–50.]
f. PAVLOV, A. & BORGARENKO, L., 1959.—[*Thominx fulicae* n.sp. from *Fulica atra*.] **1** (1/4), 51–54. [In Russian: English & German summaries p. 54.]
g. RIZHIKOV, K. & KOZLOV, D., 1959.—[The nematode fauna of wild birds in Turkmenistan.] **1** (1/4), 55–68. [In Russian: English & German summaries p. 68.]
h. RIZHIKOV, K. & PAVLOV, A., 1959.—[*Amidostomum orientale* n.sp. from Anseriformes in Yakutsk.] **1** (1/4), 69–73. [In Russian: English & German summaries p. 73.]

(130e) On the basis of physiological studies Myuge presents schematically the evolution of plant nematodes towards parasitism. Thus Rhabditidae feed on the products of the bacterial hydrolysis of plant tissue. Diplogasteridae larvae feed similarly but secrete proteolytic enzymes of the cathepsin type and a glycogen-splitting enzyme. Similar enzymes are secreted by *Hexatylus viviparus*, a representative of the plant nematodes of non-specific pathogenicity, and which feed on fungal mycelium. Plant-parasitic nematodes of specific pathogenic effect also secrete amylase which enables them to parasitize higher plants. N.J.

(130f) *Thominx fulicae* n.sp. is described and figured from *Fulica atra* in Turkmen S.S.R. and Tadzhik S.S.R. It is nearest to *T. aramidesi*, *T. confusa*, *T. nyrocinarum* and *T. spinulosum* but is characterized by the larger body (females 15·04 to 23·7 mm. long, males 12·8 to 15·3 mm. long) and by the size of the spicules (0·72 to 0·8 mm. in length) and of the eggs (0·039 to 0·062 mm. by 0·022 to 0·04 mm.). Great variation in measurements was observed between different specimens. G.I.P.

(130g) Examination of 276 birds belonging to 54 species from the basin of the Murgab river (Turkmenistan) revealed the presence of 35 nematode species in 54·7% of the birds. *Diplotriaena affinis* was recovered from the abdominal cavity of four *Passer hispaniolensis* and two *Oenantha isabelis*. It is contended that the *Diplotriaena sokolowi*, reported by Dubinina & Serkova in 1951 [see *Parazitologicheski Sbornik*, **13**, 75–95] was, in fact, *D. affinis* as its basic measurements correspond with those observed by the authors in the latter. A male and a female of *Habronema imbricata* were found in the gizzard of an *Otus scops*; this parasite is reported for the first time from the U.S.S.R. and it is a new host record. It has a large papilla, not mentioned in the original description, situated by the anterior border of the cloaca and about eight very small papillae at the tip of the male tail. One male of *Microtetrameres* sp. was found in the proventriculus of an *Athene noctua*, which is also a new host record. The paper is illustrated with diagrams. N.J.

(130h) *Amidostomum orientale* n.sp., from *Clangula hyemalis* and *Somateria spectabilis* from the Lena estuary in the Yakutsk A.S.S.R., is characterized by four large head papillae. It is differentiated from *A. anseris*, *A. spatulatum*, *A. cygni* and *A. skrjabini* by the presence of only one tooth in the buccal capsule, and from *A. boschadis*, *A. fulicae* and *A. raillieti* by the spicules which are 0·132 mm. long and branch distally. The new species is nearest to *A. chevreuxi* and *A. henryi* particularly in the shape and size of the spicules and the latter also has four small head papillae; however both are parasites of Charadriiformes. The specimens identified as *A. chevreuxi* by Ginetsinskaya from anatid birds in the Volga delta and by Rizhikov from *Nyroca fuligula* in Western Siberia [see respectively *Uchenie Zapiski Leningradskogo Gosudarstvennogo Universiteta*, seriya biol. nauk, 1949, No. 9, 81–109 and *Trud. gelmint. Lab.*, 1956, **8**, 131–139] are *A. orientale*. *A. orientale* cannot be differentiated from the remaining four species listed by Popova [see *Descriptive catalogue of parasitic nematodes*, 1952, **3**, p. 110] for *Amidostomum*, i.e. *A. acutum*, *A. anatinum*, *A. leucopareiae* and *A. monodon*, because they are insufficiently described. G.I.P.

130—Helminthologia. Bratislava. (cont.)

i. SONIN, M., 1959.—[Filariae of birds from the upper reaches of the river Yenisey (Tuva Autonomous Region).] **1** (1/4), 75–83. [In Russian: English & German summaries p. 83.]

j. SPASSKI, A. & SPASSKAYA, L., 1959.—[Cestodes of Cypseliformes and Passeriformes, phylogenetically distant but ecologically related birds.] **1** (1/4), 85–98. [In Russian: English & German summaries pp. 97–98.]

k. ŽITŇAN, R., 1959.—"Beitrag zum Vorkommen von Metacercarien *Metagonimus yokogawai* Katsurada, 1912, im Unterlauf des Flusses Hron." **1** (1/4), 99–102. [English & Russian summaries pp. 101–102.]

(130i) As a result of studies of the helminth fauna of 516 birds representing 17 species from the upper Yenisey, 11 filarial species were found from 16 bird species. The parasites belong to the genera *Hamatospiculum*, *Aprocta*, *Lissonema* and *Diplotriaena* spp. (named sp. iii, sp. iv and sp. v). *Lissonema mongolica* was found in two *Chlamydotis undulata* and *Ornithofilaria papillocerca* in two out of 20 *Tetrao urogallus*, both in the subcutaneous tissue (these represent new host records) while *Hamatospiculum quadridens*, recovered from the subcutaneous tissue of four out of 42 *Lanius cristatus*, is reported for the first time from the U.S.S.R. and is a new host record. Another new host record is that of *Aprocta microanalis* found in the orbit of four out of 14 *Luscinia svecia*, the male of which is described for the first time. Its spicules are 0·215 mm. and 0·217 mm. long respectively, pointed at the distal ends, and with funnel-shaped proximal ends. The posterior end of the body is spirally curved. No caudal papillae were observed. It is mentioned that *Ornithofilaria tuvensis* from *Tetrao parvirostris* is a new host record. The paper is illustrated with six figures. N.J.

(130j) The dilepidid cestodes parasitic in Cypseliformes are the genera *Neoliga*, *Neoangularia* and *Pseudangularia* and *Vitta swifti*, *Anomotaenia depressa* and *A. cyathiformis* (the two last-mentioned reported also from Passeriformes), and in Passeriformes the genera *Angularella* and *Vitta*, eight species of *Anomotaenia* and *Paricterotaenia parvirostris*. Spasski & Spasskaya are revising these cestodes as follows. Singh's monospecific genera *Neoliga* and *Neoangularia* differ in the absence of hooks in the latter (which was described from one specimen only); the present authors therefore suppose that *N. ababili* does in fact possess hooks and make the genus a synonym of *Neoliga*. The species may in future prove to be synonymous with *N. diplacantha*. *A. depressa* is redescribed and transferred to *Neoliga*. The material available was insufficient to allow revision of *Pseudangularia*. Furthermore there are three species of Paruterinae parasitic in Cypseliformes; they are *Notopentorchis collocaliae*, *N. iduncula* n.comb. and *N. vesiculigera* n.comb. (of which *Dilepis cypselina* becomes a synonym), the two last-named species are transferred from *Paruterina*. Of the three species of *Angularella* parasitic in Passeriformes, *A. taiwanensis* and *A. ripariae* differ from the third and type species *A. beema*, in that their hooks do not form a zig-zag line; they are transferred to *Vitta*. The specimens described by Singh in 1952 as *V. magniuncinata* have hooks only half the size of those given by Burt, 1938, and are therefore placed in *V. singhi* n.sp. *Anomotaenia rustica* and *A. cyathiformis* (of which *A. riparia* Dubinina, 1953, is made a synonym) are transferred to *Vitta*. *V. cyathiformis* n.comb. is very similar to *V. magniuncinata*, and if it proves synonymous, will take its place as type species. Although Joyeux & Baer in their description of *Paricterotaenia parvirostris* state that the hooks are in one row, their figure shows the presence of two types of hooks; it therefore appears that two rows must have been present and the species is transferred to *Vitta*. Another three species closely related to *Vitta* are *A. hirundina*, *A. ovalaciniata* (both similar to *V. minutiuncinata*) and *A. chelidonariae* but require further study. There are now nine species in *Vitta*. G.I.P.

(130k) 104 of 540 fish from the lower reaches of the Hron, a tributary of the Danube, were infected with metacercariae, which were confirmed as *Metagonimus yokogawai* by the experimental infection of a domestic cat. The metacercariae were found on the scales of *Rutilus rutilus*, *R. pigus virgo*, *Leuciscus cephalus*, *L. idus*, *Scardinius erythrophthalmus*, *Aspius aspius*, *Chondrostoma nasus*, *Alburnus alburnus*, *Blicca bjoerkna*, *Abramis brama*, *A. sapa*, *A. ballerus*, *Vimba vimba*, *Pelecus cultratus*, *Lucioperca lucioperca*, *L. volgensis* and *Aspro zingel*. The suspected first intermediate molluscan hosts in Czechoslovakian waters are *Fagotia esperi* and *F. acicularis*. G.I.P.

130—Helminthologia. Bratislava. (cont.)

l. HOVORKA, J. & MACKO, J., 1959.—"*Calcaronema* gen.nov. a new genus of the subfamily Cyathostominae Nicoll, 1927 (Syngamidae Leiper, 1912) and the description of the new species *C. trifurcatum* sp.n. and *C. verrucosum* sp.n." **1** (1/4), 103–112. [German & Russian summaries p. 112.]

m. KRASNOLOBOVA, T., 1959.—[The identity of *Prosthogonimus pellucidus* Linstow, 1873 and *Prosthogonimus anatinus* Markov, 1902.] **1** (1/4), 113–119. [In Russian: English & German summaries p. 119.]

n. MACKO, J. K., 1959.—"Zur Revision der systematischen Kennzeichen einiger Cestodenarten der Familie Hymenolepididae und Dilepididae." **1** (1/4), 121–131. [English & Russian summaries p. 131.]

o. MACKO, J. K., 1959.—"Zur Revision der Systematik der Trematode *Dendritobilharzia anatinarum* Cheatum, 1941." **1** (1/4), 133–137. [English & Russian summaries p. 137.]

(130l) Hovorka & Macko have created *Calcaronema* n.g., which differs from the genus *Cyathostoma* chiefly in the nature of the dorsal ray of the genital bursa which penetrates the bursal wall and ends with an acute thorn-shaped spear. *Cyathostoma phenisci* Baudet, 1937 from *Pheniscus humboldti* is transferred to the new genus, becoming *Calcaronema phenisci* n.comb. *C. trifurcatum* n.sp. and *C. verrucosum* n.sp. from *Ciconia nigra* and *C. ciconia* respectively are described and figured. *Calcaronema trifurcatum* differs from *C. phenisci* and *C. verrucosum* in the presence of a trifurcate latero-medial branch on each side of the dorsal ray of the genital bursa in the male and in the presence of a pair of papillae and collateral cuticular wings on the most posteriorly widened portion of the tail in the female, features which are absent from both other species. *C. verrucosum* differs from *C. phenisci* in the presence of a collateral cuticular membrane running forward from the papillae to the angles of the anal sphincter and beyond in the female and in the circumoral framework being densely covered with small warts in both sexes. The female of *C. phenisci* does not possess a cuticular membrane and the circumoral framework is smooth in both sexes. A key for the diagnosis of *Cyathostoma* and *Calcaronema* and for the three species of *Calcaronema* is given. J.W.S.

(130m) Hens, chicks, ducklings and goslings were infected with *Prosthogonimus pellucidus* metacercariae obtained from naturally infected *Cordulia aenea* and *Libellula quadrimaculata*. The parasites from hens and chicks had the typical structure of *P. pellucidus*, but those from the Fabrician sac of ducks and geese were smaller and had under-developed genitalia. Sexual maturity was reached within two weeks in chicks and on the 42nd day in ducklings. A comparison of the measurements given by Markov & Panin with those obtained by the author confirmed the identity of *P. pellucidus* and *P. anatinus*, the latter becoming a synonym of *P. pellucidus* Linstow, 1873. The paper is illustrated with six diagrams. N.J.

(130n) Macko describes and figures three cestode species collected from aquatic birds in Slovakia during spring migration. They are: (i) *Oschmarinolepis microcephala*, from *Ciconia ciconia*, which differs from the original description in the shape and size of the hooks (they are of diorchid type and 0·033 mm. in length); (ii) *Parafimbriaria websteri*, from *Colymbus caspicus caspicus*, which differs from Voge & Read's description only in the hook length (0·0181 mm.); and (iii) *Dendrouterina karajasicus* n.comb. (for *Lateriporus karajasicus*) from *Ardea cinerea*. On the basis of the shape of the testes, which are usually in two groups, the shape of the uterus and its position in relation to the ventral excretory canals, this species is placed in *Dendrouterina*, the author accepting Mahon's (1957) diagnosis of this genus and agreeing that it cannot be made synonymous with *Cyclustera*. The species is thought to be identical with Kurashvili's *L. karajasicus* although there is some variation in the size and number of hooks, which lie in two rows in Macko's specimens. Characters differentiating *D. karajasicus* from *D. ardeae* and *D. pilherodiae* are given. G.I.P.

(130o) Macko describes a male and female of *Dendritobilharzia pulverulenta* both recovered from a kidney of *Anas querquedula* in Slovakia, which lies within the distribution area of the trematode. Although descriptions of this species by European authors vary, the specimens were identified as *D. pulverulenta* principally on the structure of the female; furthermore they showed no basic differences from *D. anatinarum* in *A. platyrhynchos*, consequently *D. anatinarum* falls as synonym of *D. pulverulenta*. G.I.P.

130—Helminthologia. Bratislava. (cont.)

p. MATEVOSYAN, E., 1959.—[Revision of the genus *Paradilepis* Hsü, 1935 (Dilepididae).] **1** (1/4), 139–145. [In Russian: English & French summaries pp. 144–145.]

q. MITSKEVICH, V. Y., 1959.—[Two new species of the genus *Trichocephalus* Schrank, 1788 from *Rangifer tarandus* L.] **1** (1/4), 147–153. [In Russian: English & French summaries p. 153.]

r. SPASSKI, A., 1959.—[The phylogenetic relationship of the subfamily Metadilepidinae n.subf. (Cestoda: Cyclophyllidea).] **1** (1/4), 155–158. [In Russian: English & German summaries p. 158.]

s. BESSONOV, A. S., 1959.—[Study on the development of *Ostertagia ostertagi* in sheep.] **1** (1/4), 159–161. [In Russian: English & French summaries p. 161.]

(130p) Matevosyan has made a critical analysis of the literature on the various species of *Paradilepis* and revisions of the genus, particularly that by Mahon, 1955 [for abstract see Helm. Abs., **24**, No. 36d]. On the basis of ecological as well as anatomical data he includes the following 13 species in *Paradilepis*: *P. scolecina*, *P. delachauxi*, *P. kempi*, *P. macracantha*, *P. rugovaginosus*, *P. simoni*, *P. urceus*, *P. yorkei*, *P. burmanensis*, *P. maxima*, *P. hierticos*, *P. multihamata* and *P. longivaginosus*. Thus Matevosyan accepts that *Oligorchis burmanensis* and *Dilepis maxima* (including Mahon's specimens described as *P. kempi*) belong to *Paradilepis*, but as independent species and not synonyms of *P. kempi*. Similarly, *P. hierticos* and *P. multihamata* are removed from the synonymy of *P. urceus* (although on further examination the first two mentioned may prove to be identical), and *P. longivaginosus* from that of *P. yorkei*. *P. lloydi* and *P. varicanthos* fall as synonyms of *P. urceus*. The 13 species are differentiated in a key. G.I.P.

(130q) *Trichuris baskakowi* n.sp. [given once in the paper as *T. baskakovi*] and *T. massino* n.sp. are described and figured from reindeer in the Leningrad Zoological Garden. *T. baskakowi* is chiefly characterized by having a vas deferens shorter than the ejaculatory duct, by the thin spicule (5·6 mm. long) with a widening at the proximal end and by the tube-like testis which forms loops at the anterior end only. The vulva opens on a small, spined elevation, the cloaca is 3·98 mm. long, circum-cloacal papillae are absent and the eggs measure 0·080 to 0·083 mm. ×0·036 mm. The principal characteristic features of *T. massino* are a cloaca longer than or equal to and a vas deferens longer than the ejaculatory duct, the relative lengths of the body parts of 1 : 2 in the male and 1 : 2·9 in the female, the presence of lateral membranous alar structures on the head and the presence of cloacal papillae. The spicules are thin, 4·9 to 5·1 mm. long, with a well defined funnel-shaped extension of the proximal end. The vulva lies 0·28 to 0·4 mm. from the base of the oesophagus, its edges are turned out and swollen into a bulb, the surface of which is sparsely covered with small papillae which end in a point. G.I.P.

(130r) Spasski unites *Metadilepis*, *Proparuterina* and *Skrjabinoporus* (a genus erected by Spasski & Borgarenko for *Lateriporus merops*—in press) in one subfamily, the Metadilepidinae n.subf., on the basis of the sucker-like rostellum without a sheath, the shape of the hooks, certain sexual characters including the uterus which retains its sac-like form throughout development, and of the hosts which are insectivorous terrestrial (never aquatic) birds. In these characters, members of Metadilepidinae are nearer to typical paruterinids than to Dilepididae but differ from the former in the absence of a paruterine organ. The type genus of the small family Biuterinidae shows great similarity to *Paruterina* and consequently the family is included in Paruterinidae Mola, 1929 (=Paruterinidae Skryabin, 1940) as a synonym of Paruterininae. As Biuterinidae contains forms both with and without a paruterine organ, the new subfamily could be included in Paruterinidae but Spasski hesitates to place it so near to *Paruterina* and leaves it for the time being as an addendum to Dilepididae. G.I.P.

(130s) Faecal examinations of two lambs, each infected with 2,000 larvae of *Ostertagia ostertagi*, showed that the prepatent period was 33 and 40 days respectively. The life of the adults was 61 and 20 days. Autopsies, carried out about 107 days after infection, showed that the lambs were free from parasites. Comparing these data with those on the life-cycle in cattle [for abstract see Helm. Abs., **29**, No. 902] it is shown that in sheep the development of *O. ostertagi* takes longer and the life of the adult is much shorter. N.J.

130—Helminthologia. Bratislava. (cont.)

t. KAŠTÁK, V., 1959.—"Neue Erkenntnisse über die Embryogonie und Parthenogonie der *Fasciola hepatica* in natürlichen Verhältnissen." **1** (1/4), 163–170. [English & Russian summaries pp. 168–170.]

u. KRILOV, P., 1959.—[The biology of *Ditylenchus destructor* Thorne, 1945.] **1** (1/4), 171–177. [In Russian: English & German summaries pp. 176–177.]

v. LOGACHEV, E. D. & BRUSKIN, B. R., 1959.—[Larval reproduction of *Opisthorchis felineus* in *Bithynia leachi*.] **1** (1/4), 179–189. [In Russian: English & German summaries p. 189.]

w. MICHAJŁOW, W., 1959.—[The variability of host-parasite relationships between copepods and cestode larvae.] **1** (1/4), 191–194. [In Russian: English & French summaries p. 194.]

x. MOZGOVOI, A. & BISHAEVA, L., 1959.—[The life-cycle of *Porrocaecum heteroura* (Ascaridata, Anisakidae).] **1** (1/4), 195–197. [In Russian: English & German summaries p. 197.]

(130t) The duration of embryogeny and parthenogenesis of *Fasciola hepatica* in laboratory and natural conditions has been studied. The time required for embryogeny was 56 days at the prevailing air temperatures of 15·12°C. (autumn) and 17·62°C. (spring and summer) in two defined biotopes. This value was comparable with the 53 days obtained in the laboratory at an average air temperature of 17°C. The duration of parthenogenesis in the laboratory varied from 88 to 122 days at an average air temperature of 19°C. and was correlated with the age of the *Galba truncatula*, the higher time values being obtained in the older snails. In experiments under natural conditions, parthenogenesis lasted 333 days at an average air temperature of 10·2°C. and 414 days at 8·6°C. No development was observed in winter months. G.I.P.

(130u) Potato tubers, infected with *Ditylenchus destructor*, were planted and three plants were pulled out on each of five occasions during the vegetative period. It was observed that as the seed tubers decomposed, the nematodes migrated partly into the soil and partly into the developing plants. Most of the new tubers were infected through the stolons, others through the soil. By planting infected and non-infected tubers in the same boxes it was found that the potatoes could be infected through the soil. No specific symptoms of the infection were observed, nor did it inhibit the vegetation. N.J.

(130v) Histological studies of larval reproduction of *Opisthorchis felineus* in *Bithynia leachi* showed that very young sporocysts represent accumulations of homogeneous undifferentiated cells and have the ability to reproduce themselves asexually by simple divisions into two or more daughter sporocysts. The authors state that further development proceeds basically in two ways. Egg cells separate themselves from the undifferentiated cells and by parthenogenetic development outside the sporocyst give rise to young sporocysts or rediae. Intensive multiplication of the undifferentiated cells situated by the wall of the sporocyst results in morula-like formations, which are the embryos of rediae; these rediae are thought therefore to be the product of asexual reproduction and it is stated that this phenomenon should be considered as a form of paedogenesis. N.J.

(130w) From personal observations and the data obtained by co-workers, Michajłow concludes that the host-parasite relationship between copepods and larval cestodes can be affected by factors to which the parasite has been subjected during its free-living stage. These factors, which the author describes as factors of delayed action, are the water temperature, the quantity of oxygen, the time the larva remained in the water, the sex and age of the host and its individual characteristics as well as those of the parasite and the type of environment. Phenological, ecological and geographical conditions are also important. N.J.

(130x) Eggs of *Porrocaecum heteroura*, obtained from the uterus of a worm from *Tringa glareola*, developed motile larvae after cultivation for 20 days on moist filter-paper with free access of air at 12° to 20°C. Ten days later these embryonated eggs were fed with soil to earthworms. Larvae, 2·576 mm. long by 0·122 mm. maximum width, were found in the ventral blood vessel three-and-a-half months after infection; the cuticle is finely, transversely striated. It is stated that the larvae remained viable in the blood vessels of earthworms for over a year. The paper is illustrated with two diagrams. N.J.

130—Helminthologia. Bratislava. (cont.)

y. OSHMARIN, P., 1959.—[Two types of initial stages in the development of helminths.] **1** (1/4), 199–204. [In Russian: English & German summaries pp. 203–204.]
z. PETROV, A. & DUBNITSKI, A., 1959.—[The development of *Diphyllobothrium latum* in foxes and arctic foxes.] **1** (1/4), 205–207. [In Russian: English & German summaries pp. 206–207.]
ba. SHMITOVA, G., 1959.—[Development of *Ascarops strongylina* in its definitive host.] **1** (1/4), 209–219. [In Russian: English & German summaries p. 219.]
bb. GORINA, N., 1959.—[The role of foxes in the epizootiology and epidemiology of unilocular echinococcosis.] **1** (1/4), 221–223. [In Russian: English & German summaries p. 223.]
bc. KUROCHKIN, Y., 1959.—[Cercarial dermatitis in man in the region of the Volga delta.] **1** (1/4), 225–229. [In Russian: English & French summaries p. 229.]

(130y) Oshmarin concludes that all, or almost all, helminth eggs have one of two types of initial development. The first type, termed "liberlarval", is characterized by the fact that the larva hatches in the external environment, where it encounters its host. The eggs of these helminths are characterized by their large size and thin shell. The second type, termed "inclusiolarval", is characterized by the fact that the larva does not hatch until the egg is swallowed by the host. These eggs are usually small with a thick shell. N.J.

(130z) Faecal examinations of 12 foxes, three arctic foxes and five dogs showed that *Diphyllobothrium latum* reached sexual maturity 16 to 36 days, 17 to 23 days and 14 to 23 days respectively after experimental infections. 48 arctic foxes were naturally infected, each with one *D. latum*. 40 of 50 naturally infected foxes each had only one tapeworm while the other ten each had two to six. The length of the adults from foxes ranged from 60 mm. to 1,955 mm. and that of those from arctic foxes from 75 mm. to 450 mm. The life of the parasites was 25, 64 and 112 days in three experimentally infected foxes, and 47 and 389 days in two similarly infected arctic foxes. N.J.

(130ba) Eight piglets, two to six weeks old, were infected with third-stage larvae of *Ascarops strongylina* from naturally infected *Copris lunaris*, *Geotrupes spiniger* and *G. mutator*. A large proportion of the larvae found their way into the mucous membrane of the fundus of the stomach during the first 24 hours. Thence the larvae migrated into the pyloric part of the stomach, where they reached sexual maturity after about one-and-a-half months. The first moult occurred four to five weeks after infection. The fourth-stage larva has the tail ending in a blunt cone, the cuticle has fine spines less apparent at the head and tail-ends, and the terminal mouth opening has two lateral lips divided into three unequal lobes. 26 days after infection all the larvae were in the fifth stage. The paper is illustrated with numerous diagrams. N.J.

(130bb) Four *Vulpes vulpes* and one dog were each infected with 125,000 viable scoleces of *Echinococcus granulosus*. On the 92nd day after infection only the dog emitted proglottides. The dog was autopsied on the 100th day and was found to contain 250 specimens. The foxes autopsied on the 102nd day contained 2,000, 250, 370 and 450 specimens respectively. It is concluded that young foxes can spread *E. granulosus* infection among men and domestic animals. N.J.

(130bc) Following the frequent occurrence of dermatitis among the inhabitants of the Volga delta, Kurochkin experimentally infected himself. Out of 30 [unnamed] cercarial species used, two only (one from *Galba palustris*, the other from *Lymnaea stagnalis*) provoked dermatitis which was more pronounced with the cercariae from the latter. The symptoms caused included slight headaches, cough and fever. Ducks autopsied two, seven and 15 days after experimental infections with the cercariae from *L. stagnalis* had pulmonary haemorrhages but harboured no trematodes. The author proposes the term "cercariasis" as a general description of diseases caused by cercariae. The two pathogenic cercariae are figured. N.J.

130—Helminthologia. Bratislava. (cont.)

bd. PODYAPOLSKAYA, V. P., 1959.—[Epidemiological classification of the principal helminth infections of man.] **1** (1/4), 231–234. [In Russian: English & French summaries p. 234.]

be. DOLNIKOV, Y. Y., 1959.—[Basic copper salts (hydroxycarbonate and hydroxysulphate) as new anthelmintics for the control of tapeworms in sheep.] **1** (1/4), 235–238. [In Russian: English & German summaries pp. 237–238.]

bf. NIKULIN, T., 1959.—[Destruction of *Ascaris lumbricoides* ova in pigsties by ultra-violet irradiation.] **1** (1/4), 239–242. [In Russian: English & German summaries p. 242.]

bg. BOGOYAVLENSKI, Y., 1959.—[The microstructure of the cuticle and hypodermis in some Ascaridata.] **1** (1/4), 243–247. [In Russian: English & German summaries p. 247.]

bh. TSVETAEVA, N. P., 1959.—[Histopathology of *Paramphistomum* infection in calves.] **1** (1/4), 249–255. [In Russian: English & French summaries pp. 254–255.]

(130bd) Podyapolskaya subdivides geohelminths and biohelminths into groups based on the relationship between the early developmental stages and the external environment and on the mode of infection of the definitive host. Geohelminths are divided into two groups; the first is characterized by the fact that the definitive host is infected by swallowing an egg which has developed in the external environment and the second by the fact that the host is infected by larvae penetrating the skin. Biohelminths are also divided into two groups according to whether or no an intermediate host is indispensable. On the basis of the relationship between the early developmental stages and the external environment biohelminths are also subdivided into (i) those for which the external environment is not necessary; (ii) those which need the external environment only to contact the intermediate host and (iii) those of which the eggs develop in the external environment. Each of these three groups is subdivided into two subgroups on the basis of the mode of infection of the definitive host. N.J.

(130be) The toxicity of copper hydroxycarbonate, hydroxysulphate and hydroxychloride was tested on 76 lambs and 20 sheep. The first was as toxic as copper sulphate and the others 2·5 times as toxic. Calculated according to their copper content, the toxicity of copper hydroxycarbonate was half that of copper sulphate, while that of the others was 20 to 30% greater. When copper hydroxycarbonate and hydroxysulphate were given *per os* to 42 sheep and to 18 four- to six-month-old lambs with monieziasis after 12 to 14 hours' hunger diet and at the doses of 0·5 gm. to 1·0 gm. per head, the hydroxycarbonate gave 75 to 87·5% complete cures and the hydroxysulphate 83·3 to 100%. Copper hydroxychloride had a comparatively low efficacy. N.J.

(130bf) Six samples, each containing 100 pig *Ascaris* eggs were subjected to ultra-violet rays emitted by a mercury vapour lamp at a distance of one meter. The eggs were irradiated for three to ten minutes on 12 to 19 occasions over 10 to 15 days. All the treated eggs were killed while 84 of 100 control eggs were viable on the 50th day after the start of the experiment. N.J.

(130bg) Histological studies showed that the cuticle in most *Ascaris lumbricoides* contained a basal layer and a basal membrane, while in *A. suum* only a basal membrane was present. This basal membrane protrudes into the subcuticular tissue by means of equidistant outgrowths. The subcuticle of these two species and of *Parascaris equorum*, which was also studied, presents a richly vacuolized syncytium, with round or oval nuclei containing one to three nucleoli. This tissue is pierced by numerous circular, longitudinal and oblique fibrils fulfilling a supporting function. N.J.

(130bh) In the Ukraine young *Paramphistomum* sp. were localized chiefly in the duodenum of one- to two-year-old cattle and penetrated the intestinal wall as far as the muscular layer; they were also found in the Brunner's glands and in the lymphatic follicles of the intestine. The pathological changes due to acute paramphistomiasis caused by the immature flukes are characterized by leucocyte infiltration, mainly eosinophilic, necrotic changes of the mucous membrane, oedema and disturbance of glandular and other intestinal structures. Chronic paramphistomiasis is characterized by atrophic lesions of the rumen mucosa. It is concluded that the pathogenicity of the infection does not depend solely on the extent of the pathological changes, but also on the localization of the parasite and its more or less intimate contact with the host tissues. N.J.

130—Helminthologia. Bratislava. (cont.)

bi. MATOV, K., VASILEV, I., OSIKOVSKI, E. & YANCHEV, Y., 1959.—[The importance of microfilariae of *Onchocerca* in the aetiology of periodic ophthalmia in horses.] **1** (1/4), 257–266. [In Russian: English & German summaries pp. 265–266.]

bj. LOGACHEV, E. D. & BRUSKIN, B. R., 1959.—[The morphological features of the compensating adaptable reaction of the heart muscle in cysticerciasis.] **1** (1/4), 267–271. [In Russian: English & German summaries p. 271.]

bk. STEFAŃSKI, W., 1959.—[The transmission of bacteria and viruses by helminth larvae.] **1** (1/4), 273–280. [In Russian: French & German summaries pp. 279–280.]

bl. POLYAKOVA, O. I., 1959.—[Hyaluronidase or 'penetration factor' in *Dictyocaulus filaria*.] **1** (1/4), 281–285. [In Russian: English & French summaries p. 285.]

(130bi) Autopsies of 412 horses in Bulgaria showed that most of them were infected with one or more of the following parasites: *Onchocerca cervicalis*, *O. reticulata*, *Setaria equina* and *Parafilaria multipapillosa*. Of these, *O. cervicalis* and *O. reticulata* were the most frequent. 287 of the horses had no clinical symptoms of periodic ophthalmia although adult *O. cervicalis* was found in 236, while its microfilariae were found in the eyes of 216 but no pathological changes were observed. 101 out of 125 affected with periodic ophthalmia had microfilariae of *O. cervicalis* in the eye. The disease was acute in four but only one had a heavy microfilarial infection of the eyes. Out of 41 healthy donkeys 12 harboured adult *O. cervicalis* and eight had microfilariae in the eye. It is concluded that microfilariae of *O. cervicalis* cannot be considered as the primary cause of periodic ophthalmia. N.J.

(130bj) Logachev & Bruskin carried out histological studies of the heart muscle in a case of intense cysticerciasis of the myocardium of a pig which showed no clinical symptoms of the infection. The absence of functional disorders of the heart is explained by: (i) the fact that the connective tissue capsule of the cysts has sparsely distributed fibres; (ii) the presence of numerous blood vessels in the capsule; (iii) amitotic reproduction of the nuclei of the contractile fibres adhering to the cyst and an increase in length of these fibres. N.J.

(130bk) From the literature and personal experiments, Stefański concludes that the fact that bacteria and viruses are more easily transmitted by helminths through the host's skin than through the intestinal mucous membrane, confirms that the former is a less important barrier than is the latter. In his personal experiments the author mentions that out of numerous attempts to transmit swine erysipelas to pigs by moistening the skin and then applying larvae of *Strongyloides papillosus* only one was successful. *Ascaris* larvae from pigs with erysipelas did not transmit the infection to healthy pigs. It was found that Newcastle disease virus adhered to the cuticle of *Ascaridia galli* and could be isolated from its internal organs, but was not present in its eggs. It is suggested that the fact that germs are transmitted by helminths in some cases and not in others could be explained by the relationship between the helminths and the intestinal bacterial flora. N.J.

(130bl) Aqueous extracts of larval and sexually mature *Dictyocaulus filaria* were tested for the presence of hyaluronidase by measuring their depolymerizing effect on 0·1% hyaluronic acid by Ostwald's viscometer (with a 0·8 mm. capillary at 20°C.). The adult worm extract produced an average reduction in relative viscosity of 0·21 in 18 hours while the controls, consisting of the boiled solution, showed practically no reduction. A reduction in relative viscosity of from 0·44 to 0·54 was obtained with the larval extract and with a physiological solution in which the larvae had been kept for a few hours, as compared to 0·08 to 0·12 in the respective controls. Thus the enzyme is present in the larvae and, to a lesser extent, in the adults of *D. filaria* and can also be secreted by the larvae into the medium. G.I.P.

130—Helminthologia. Bratislava. (cont.)

bm. VESELOVA, T. P., VELIKOVSKAYA, Y. A. & GORDEEVA, L. M., 1959.—[Toxicity of carbon tetrachloride to cattle. I. Pharmacology and biochemistry.] **1** (1/4), 287–290. [In Russian: English & German summaries p. 290.]

bn. SHIKHOBALOVA, N. P. & PARUZHINSKAYA, L. S., 1959.—[The effect of ionizing irradiation on the embryonic and postembryonic development of *Ascaridia galli* (Schrank, 1788).] **1** (1/4), 291–299. [In Russian: English & French summaries pp. 298–299.]

bo. VODRÁŽKA, J., 1959.—"Über eine Methode der kritischen Auswertung von Stoffen, welche gegen die in den Bronchen parasitierenden Helminthen wirken." **1** (1/4), 301–306. [English & Russian summaries pp. 305–306.]

bp. BREZA, M., 1959.—[Earthworms as intermediate hosts of metastrongylid lungworms of pigs. I. *Eisenia veneta* (Rosa) var. *hortensis* (Mich.).] **1** (1/4), 307–308. [In Russian.]

(130bm) Experiments carried out on albino rabbits and isolated sections of cat and guinea-pig intestine showed that carbon tetrachloride had neither histaminic nor antihistaminic effect. The quantity of histamine in the blood plasma of 21 cows was determined. It was found that the plasma of healthy cows contained 3 μgm.% to 5 μgm.% of histamine and that of cows infected with *Fasciola* 14 μgm.% to 20 μgm.%. The plasma of cows which had received 4 ml. of carbon tetrachloride per 100 kg. body-weight intramuscularly, contained 13 μgm.% to 26 μgm.% of histamine [the summaries give 18 μgm.% to 26 μgm.%] and the plasma of cows which received 15 ml. intraruminally contained 36 μgm.% to 40 μgm.% of histamine; two of these cows died 12 to 14 hours after dosing. N.J.

(130bn) Irradiation of *Ascaridia galli* eggs with X-rays and Co^{60} affected development as previously described for this species and *Ascaris* [for abstracts see Helm. Abs., **27**, No. 255ba and **30**, No. 1999]. X-irradiation of infective eggs at doses of 4,000r. and 15,000r. resulted in a reduction in size of the nematodes which developed in chickens; such a reduction was not observed after a dose of 2,000r. Both X-rays and Co^{60} rays affected the males more than the females. N.J.

(130bo) Vodražka devised a technique for assessing the efficacy of treatment of lungworms in sheep. A total tracheotomy is performed and the end of the trachea is inserted into a slightly bent plastic tube to which is attached an absorbent gauze bag. The bags should be changed three or four times a day. The sheep are killed after three to four days and the lungs examined. This method has been used on 67 sheep; five died before the fifth day after surgery. N.J.

(130bp) [For abstract of fuller account of this work see No. 128b above.]

131—Hospital. Rio de Janeiro.

a. SAN JUAN, F., 1959.—"Aspectos anatomoclínicos da estrongiloidose." **56** (1), 1–17. [English summary p. 16.]

b. CAMPOS, R., FERREIRA, C. S. & AMATO NETO, V., 1959.—"Investigações *in vitro* relativas à ação da ditiazanina sôbre *Ascaris*." **56** (1), 39–42. [English summary p. 42.]

c. PRICOLI, T. I., 1959.—"Aspectos clínicos das parasitoses intestinais. Importância das parasitoses intestinais em gastroenterologia. Notas práticas." **56** (1), 43–51.

d. KLOETZEL, K., 1959.—"O problema das 'raças' de *S. mansoni*." **56** (1), 81–88. [English summary p. 87.]

e. FEIGENBAUM, E., 1959.—"Tratamento intensivo da ascaridiose e da oxiurose com citrato de hexahidropirazina (Bryrel)." **56** (1), 121–124.

(131b) Dithiazanine, in doses of 0·198 gm. to 2·376 gm. per 300 ml. of 0·9% saline solution, failed to kill ascarids from pigs after 20 minutes whereas hexylresorcinol showed good anti-ascarid activity. Similar results were obtained against *Ascaris lumbricoides* of human origin, although the concentration of the drug and the time of exposure were greater. N.J.

(131d) Kloetzel discusses the possibility that in Brazil there are different strains of *Schistosoma mansoni*, as elsewhere with *Schistosoma* species, to which differences in pathogenicity in distinct highly endemic areas could be attributed. It is suggested that their pathology in laboratory animals would be a good indicator of the difference in strains. N.J.

132—Indian Journal of Child Health.

a. SAYED, B. A., SHAH, S. & ACHARYA, P. T., 1959.—"Intestinal obstruction and death due to *Ascaris lumbricoides*." **8** (9), 501–503.

133—Indian Journal of Malariology.

a. BURTON, G. J., 1959.—"Studies on the bionomics of mosquito vectors which transmit filariasis in India. I. Attachment of *Mansonia annulifera* and *Mansonia uniformis* larvae to host plants occurring in *Pistia* tanks in Kerala, South India." **13** (2/3), 75–115.

b. NAIR, C. P., KRISHNAN, K. S. & ROY, R. G., 1959.—"Filariasis in Kerala State. Part V. Filaria survey of Edapally Panchayat (Ernakulam District)." **13** (2/3), 117–123.

c. KRISHNASWAMI, A. K., PATTANAYAK, S. & RAGHAVAN, N. G. S., 1959.—"The susceptibility of *Culex fatigans* to different densities of *Mf. bancrofti*." **13** (4), 153–157.

d. SINHA, A. P., NANDA, D. K., SINGH, M. V. & DIWAN CHAND, 1959.—"Day and night filaria surveys in some persons with periodic *W. bancrofti* before and after diethylcarbamazine therapy." **13** (4), 159-162.

e. DIWAN CHAND, SINGH, M. V. & SHRIVASTAVA, R. N., 1959.—"Note on filariasis in Hardoi town, Uttar Pradesh." **13** (4), 163-173.

(133a) In Kerala, South India, the "tanks", i.e. small ponds which provide water for household use, often contain water plants to which the larvae of *Mansonia annulifera* readily attach themselves wherever the plant tissue contains air chambers and is easily penetrable. No preference was shown by larvae of *M. uniformis* or *M. annulifera* for *Pistia* or *Eichhornia* when both plants were present. 54 photographs illustrate 12 species of host plants and the method of attachment to roots or horizontal leaves at the surface of the water. R.T.L.

(133b) The incidence of filariasis in Edapally Panchayat on the coastal strip of Kerala has scarcely changed during the last 25 years. The average microfilarial rate in the whole community is now 12·7% [11·7% of 631 persons recorded in Tables I and II]. 10·4% of those examined had swelling of the upper and lower limbs and, occasionally, hydrocele. The predominant species was *Wuchereria malayi* and the only vector found was *Mansonia annulifera* with an infection rate of 12·9% and an infectivity rate of 13·2%. The mosquitoes bred in ponds with *Pistia stratiotes* and organic pollution. R.T.L.

(133c) Infective larvae were recovered from *Culex fatigans* fed on volunteers in whose blood no microfilariae of *Wuchereria bancrofti* had been detected. In those with up to 100 microfilariae per 20 cu.mm. the percentage of mosquitoes infected and the number of infective larvae per infected mosquito increased but in those with higher microfilarial blood counts the infective larvae per infected mosquito fell. The importance of determining infective larval counts in positive mosquitoes in assessing the efficacy of control measures is discussed. R.T.L.

(133d) After a five-day course of diethylcarbamazine given in a dose of 4 mg. per kg. body-weight to 857 persons carrying a *Wuchereria bancrofti* infection, no evidence was obtained in support of the view that this drug caused a change or reversal of filarial periodicity. R.T.L.

(133e) The incidence of filariasis in Hardoi town with a population of 29,881 in 1951 has increased so much in recent years as to attract public notice. In the survey now reported, in 1,846 individuals from all age groups and from both sexes the over-all rate of infection was 10·29%, the disease rate 10·72% and the endemicity rate 19·82%. The chief manifestations of the infection were hydrocele and other genital lesions which occurred in 155 persons. Of 380 anopheline and culicine mosquitoes dissected, larval filariae were found in *Culex fatigans*. The local increase of filariasis is largely attributed to the annual migration of about 500 to 600 labourers into the town from the districts of Deoria and Gorakhpur where *Wuchereria bancrofti* is endemic. R.T.L.

134—Indian Journal of Public Health.

a. RICE, D. T., 1959.—"Guinea worm in Semra (M.P.)." **3** (3), 289–293.

135—Indian Journal of Veterinary Science and Animal Husbandry.

a. MALIK, B. S., RAI, P. & AHLUWALIA, S. S., 1959.—"A note on helminths of the Indian elephant. I. Amphistomatous parasites." **29** (1), 11–17.

(135a) After reviewing the literature of amphistomes in the Indian elephant and noting certain discrepancies and inaccuracies in earlier descriptions and illustrations, the salient features of *Pfenderius papillatus*, *P. heterocaeca* and *Pseudodiscus hawkesii* are redescribed and figured. *Tegumaea* is a synonym of *Pfenderius*. *Pseudodiscus hawkesii* differs from *P. collinsi* in the relative position of the testes to one another; in the former species they lie one behind the other and in the latter they lie symmetrically side by side. R.T.L.

136—Informatore Fitopatologico. Bologna.

a. MARINARI, A., 1959.—"I nematodi e gli alberi da frutto." **9** (8), 158–160; (9), 188–190.

(136a) Marinari gives an account of the most important plant-parasitic nematodes found infecting fruit trees and vines in Italy. On peach and vine *Meloidogyne* spp. occur, while *Tylenchulus semi-penetrans* is found on citrus, vine, *Diospyros lotus* and olive. *Pratylenchus* spp. attack *Malus* sp., *Prunus* spp., citrus, fig and vine and *Radopholus similis* is found on citrus. In the second part of the article control of nematodes by chemical, physical and agronomic methods is described. Most of the newer chemicals are mentioned, with suitable dosage rates and reference is made to warm-water treatment of infected stocks and the growing of resistant varieties. [The originators of some of the control methods are mentioned but no references are given.] M.T.F.

137—Izvestiya Akademii Nauk SSSR. Seriya Biologicheskaya.

a. EMANUILOV, I., 1959.—[The interrelationship between bacteria and ascarids in the intestinal parasitocoenosis of the pig and horse.] Year 1959, No. 2, pp. 228–234. [In Russian: English summary p. 234.]

(137a) *In vitro* experiments have shown that the relationship between ascarids (from pig and horse) and the intestinal bacteria, *Bacterium coli commune*, *Pseudomonas pyocyanea* and often also *Proteus vulgaris*, is a symbiotic one. Ascaris body fluid had no effect on these three Gram-negative bacteria and also *Staphylococcus pyogenes albus*, *Bacillus subcuticularis* and a strain of *B. mycoides* (isolated from pigs), but did inhibit *Sarcina lutea*, *Clostridium sporogenes*, a strain of *B. mesentericus* and the Gram-negative *Bacterium alcaligenes*. Other strains and species were sensitive in some experiments but not in others. Thus not all of the Gram-positive bacteria are affected [compare with Jettmar, 1952; for abstract see Helm. Abs., **21**, Nos. 548a and 604a]. An additional bactericidal action is, however, exerted by the symbiotic *Pseudomonas pyocyanea*; all the Gram-positive bacteria and also *B. alcaligenes* were affected to a greater or lesser extent. When the proteolytic enzyme from *B. mesentericus* was allowed to act on ascarids not protected by *P. pyocyanea*, it caused lysis of the cuticle and death of the worms. G.I.P.

138—Journal of Agriculture of Western Australia.

a. LEWIS, P. B., 1959.—"Tapeworms of dogs and cats." 3rd series, 8 (3), 377–378.

139—Journal of the American Medical Association.

a. GARCÍA-PALMIERI, M. R., RAFFUCCI, F. L., DÍAZ-BONNET, L. A. & BERNAL-ROSA, J. F., 1959.—"Shunt surgery for portal hypertension due to *Schistosoma mansoni*. Evaluation and management in forty-one cases." **171** (3), 268–271.

b. INNELLA, F. & REDNER, W. J., 1959.—"Latex-agglutination serologic test for trichinosis. Preliminary report." **171** (7), 885–887.

(139b) A new and simple agglutination procedure for the diagnosis of trichinelliasis is described. A stock suspension of latex (polystyrene) particles (0·81μ in size) in distilled water is added to *Trichinella* extract, prepared by Bozicevich's method, and glycine saline buffer

solution. 0·1 ml. of antigen with 0·1 ml. of serum is incubated for 30 minutes at 37°C., cooled at room temperature and centrifuged at 2,000 r.p.m. for three minutes. Positive tests have sparkling clear supernatants while negative tests are cloudy without agglutination. The test may be made in small test tubes or on slides. In the slide test only one drop of latex *Trichinella* antigen mixed with one drop of serum is required. R.T.L.

140—Journal of the Association of Physicians of India.

a. NATH, K. & PANDEYA, S. N., 1959.—"Aberrant presentations of tropical eosinophilia." **7** (4), 310–319.
b. CHHUTTANI, P. N. & CHUGH, K. S., 1959.—"Hookworm disease in the Punjab." **7** (4), 327–331.

141—Journal of the Egyptian Medical Association.

a. ABDALLAH, A., SAIF, M. & TAHA, A., 1959.—"The therapeutic value of glucosamine in schistosomiasis." **42** (11), 631–635.
b. HABIB, S. A. & HABIB, Y. A., 1959.—"Effect of chlorothiazide in bilharzial hepatic fibrosis with ascites." **42** (11), 636–653.
c. ABDALLAH, A. & SAIF, M., 1959.—"Nitrated aluminium naphtholate in the treatment of ancylostomiasis." **42** (11), 654–658.
d. EL-BANHAWY, A., 1959.—"Cutaneocystoplasty. A new technique for the management of the contracted bilharzial bladder (preliminary report)." **42** (11), 698–704.
e. EL-BITASH, M. H., ABDALLAH, A., SAIF, M. & TAHA, A., 1959.—"Evaluation of the efficiency of 1-p-aminophenoxy-5-phthalimidopentane in the treatment of schistosomiasis. (A preliminary report)." **42** (12), 705–718.
f. FAYEZ, M. & RAGHEB, M., 1959.—"Effect of trivalent antimony treatment of schistosomiasis on liver function tests." **42** (12), 719–726.

(141a) Experimental work on mice, each infected with 25 cercariae of *Schistosoma mansoni*, confirmed the observations by Bueding, Ruppender & MacKinnon in 1954 [for abstract see Helm. Abs., **23**, No. 301a] that glucosamine caused a significant shift of worms to the liver as with antibilharzial compounds but viable eggs continued for two months to be present in the faeces and miracidia developed to cercariae in the snail vectors. In eight adult patients with double infections of *S. mansoni* and *S. haematobium* daily doses of from 6 gm. to 12 gm. were given for up to 20 days; the urine and faeces showed no significant reduction in the intensity of the infections during a follow-up period of one month. There were no toxic or side effects. R.T.L.

(141b) Chlorothiazide proved a valuable and effective oral diuretic in 16 patients with bilharzial hepatic cirrhosis with ascites and is considered superior to mercurial treatment as it has no untoward side effects on the kidneys. R.T.L.

(141c) Tablets of nitrated aluminium naphtholate in daily doses of 200 mg. to 400 mg. for three days gave significant reductions in the egg counts in 28 out of 29 patients with hookworm infection but owing to the toxic effects it is not recommended for further trials. R.T.L.

(141e) The recently introduced drug (M & B 2948A) 1-*p*-aminophenoxy-5-phthalimidopentane, after preliminary tests on Swiss mice infected with *Schistosoma mansoni* was administered as 0·5 gm. tablets to patients with urinary or intestinal schistosomiasis. No deaths occurred in the six mice given 400 mg. per kg. body-weight for four successive days, there was a significant hepatic shift of the worms and all the mice were cured. In the human cases a total dose of 250 mg. per kg. given over two days caused severe side reactions but when given over a period of five days a total of 300 mg. per kg. had no toxic effects. Of nine urinary schistosomiasis patients treated with a total of 300 mg. per kg., over five to six days, five became negative, one passed dead eggs and in three the eggs passed were significantly lowered in number. Of three patients with intestinal *S. mansoni* infection one became negative after seven days while the eggs in the faeces of the other two were lowered significantly. One *S. mansoni* patient tolerated a total of 450 mg. per kg. given over six days and became negative 25 days later. There were no obvious visual disturbances during treatment but retinoscopy was not done. R.T.L.

(141f) Liver function tests showed that while cases of schistosomiasis could stand treatment with stibophen without damage to the liver, none with liver damage was improved by treatment. R.T.L.

142—Journal of the Egyptian Veterinary Medical Association.

a. NAGATY, H. F., EL-GINDY, H. S. & ABDEL MAGEED, S. M., 1959.—"On the morphology, anatomy and trematode infection of some lymnaeid snails from Egypt with special reference to fascioliasis." **19** (1/2), 51–77.

(142a) Nagaty *et al.* describe and figure *Lymnaea caillaudi*, *L. columella*, *L. stagnalis* and *L. truncatula*, identified from their collections of lymnaeid snails from various localities in Egypt. *Cercaria natrouni* n.sp., a stylet cercaria from *L. stagnalis*, is described and figured [no differential characters are given]. The authors state that the stylet of this cercaria is arrow-shaped at its anterior end and is provided with two circular thickenings just behind the pointed end; one pair of virgulae are present. One of 41 *L. truncatula* was found infected with cercariae resembling those of *Fasciola gigantica* obtained from *L. caillaudi*; if further investigations prove these to be *F. gigantica* cercariae this will be the first record of the parasite in *L. truncatula* in Egypt. *L. columella* and the infection of one specimen with *Fasciola* sp. rediae are new for Egypt. *L. caillaudi* was found naturally infected with *F. gigantica* cercariae and with unidentified stylet cercariae. J.W.S.

143—Journal of the Formosan Medical Association.

a. WU, Y. T. ET AL., 1959.—"Filariasis and its control in Taiwan." **58** (4), 228–238.

(143a) Wu *et al.* give a review of previous work on the incidence of filariasis in Taiwan, which indicates that *Wuchereria bancrofti* was present in certain townships in Taiwan proper and also in the Pescadores. Of the evacuees to Taiwan from the mainland in 1955 nearly 10% were found to be infected with *W. malayi* [=*Brugia malayi* (Brug, 1927) Buckley, 1960]. Filariasis is now considered by the authors to be a very important public health problem in Taiwan. The mosquito vector appears to be *Culex fatigans*. In 1956 a project was begun to examine for microfilariae the servicemen in Taiwan and the civilians in the Pescadores and to treat all the carriers. Of 181,478 servicemen 2,437 were found positive (mixed *W. bancrofti* and *B. malayi*) and of 58,779 civilians 3,896 were positive for *W. bancrofti* only. Tables are provided to show the incidence in different townships or provinces and the sex and age incidence in 50,029 civilians in the Pescadores. The civilian female population of the Pescadores, in age groups lower than 20 years, showed a higher incidence of microfilarial infection than the male. In age groups above 20 it was conversely higher in males. Of 3,896 civilians with microfilariae 91·12% were treated with hetrazan for a week or more and 64·92% of these became negative; 5·06% were still positive. 21·15% were not examined after treatment and 8·88% were not treated at all. Side effects of the treatment were noticed in some people, e.g. headache, fever, nausea, anorexia, etc., but were not serious enough to interrupt the treatment. J.J.C.B.

144—Journal of Immunology.

a. KAGAN, I. G., NORMAN, L. & ALLAIN, D. S., 1959.—"Studies on the serology of visceral larva migrans. I. Hemagglutination and flocculation tests with purified ascaris antigens." **83** (3), 297–301.

(144a) 14 antigens were prepared from *Ascaris lumbricoides* var. *suum* and included whole worm and tissue extracts, polysaccharide preparations and the protein antigen prepared according to the method of Melcher [see *J. infect. Dis.*, **73**, 31–39]; in addition an antigen from *Toxocara canis* was prepared by Melcher's method. These antigens were tested using the tannic acid haemagglutination test and the bentonite flocculation test against antisera prepared against rabbits infected with either *Ascaris* or *Toxocara* or injected with *Ascaris* or *Toxocara* antigens. In addition sera from children presumed to be infected with visceral larva migrans were used. All but two of the antigens were serologically active but no specificity was demonstrable by any of the antigens employed or any of the techniques. E.J.L.S.

145—Journal de Médecine de Bordeaux et du Sud-Ouest.

a. SIGALAS, R. ET AL., 1959.—"A propos d'un cas de distomatose hépato-biliaire à *Dicrocoelium dendriticum*." **136** (5), 585–592.

146—Journal of the Osaka City Medical Center.

a. MATSUMOTO, T., 1959.—[An experimental study of the anaemia factor of hookworms. Part I. Simplified media for culture of hookworms.] **8** (5), 618–626. [In Japanese: English summary p. 618.]

b. MATSUMOTO, T., 1959.—[An experimental study of the anaemia factor of hookworms. Part II. Anaemia factor of hookworms released in culture media.] **8** (5), 627–645. [In Japanese: English summary p. 627.]

(146a) The survival rate of canine hookworms at 37°C. in distilled water, water from ponds and brooks, glucose solution, polypeptone solution, polytamine solution and in various amino-acid solutions was studied by Matsumoto. They remained alive in 1% to 3% amino-acid solutions for 40 to 60 hours which was the longest survival period; at optimum concentrations of glycine, alanine, threonine, valine, arginine, glutamic acid, histidine and hydroxyproline the average survival time was more than 50 hours. Y.Y.

(146b) Five hundred canine hookworms were cultured for eight hours at 37°C. in 0·6% glycine, 1·25% arginine or 1·25% histidine solution. Culture media were injected subcutaneously into the backs of rabbits and conspicuous anaemia was produced. No anaemia appeared in rabbits injected with a control solution. Matsumoto concluded that the anaemic factor of canine hookworms, released into amino-acid culture media, appeared to be heat-stable with a boiling point over 100°C. and soluble to ether, alcohol or acetone. He also suggested that this factor was not a free fatty acid but more complicated lipid material. Y.Y.

147—Journal of Pediatrics.

a. HUCHTON, P. & HORN, R., 1959.—"Strongyloidiasis." **55** (5), 602–608.

148—Journal of the Tennessee Academy of Science.

a. BOGITSH, B. J. & CHENG, T. C., 1959.—"*Pisciamphistoma reynoldsi* (Paramphistomatidae). A new trematode parasite of *Lepomis* spp. in Virginia." **34** (3), 159–161.

(148a) *Pisciamphistoma reynoldsi* n.sp. is described and figured from *Lepomis macrochirus* and *L. gibbosus* from Virginia, U.S.A. It differs from *P. stunkardi*, type and only other species of the genus, in the extracaecal position of the genital pore and in the oesophagus, which is thinner and distinctly muscular with a definite spherical, muscular oesophageal bulb. S.W.

149—Journal of Veterinary and Animal Husbandry Research. Mhow, India.

a. SHAH, H. L. & PANDIT, C. N., 1959.—"A survey of helminth parasites of domesticated animals in Madhya Pradesh. Part I." **4** (1), 1–10.

b. SHAH, H. L., 1959.—"A case of triple helminthic infection in a tigress (*Panthera tigris*)." **4** (1), 24–26.

(149a) The results of this survey of the helminth parasites of domesticated animals in Madhya Pradesh, India, conducted during 1956–58 are tabulated and are compared with those of earlier surveys. The commonest parasites were: of cattle, *Fasciola gigantica* (*F. indica*?), *Cotylophoron cotylophorum* and *Gastrothylax crumenifer*; of sheep and goats, *F. gigantica* (*F. indica*?), *C. cotylophorum*, *G. crumenifer*, *Moniezia expansa*, *Bunostomum trigonocephalum* and *Haemonchus similis*; of horses, *Strongyloides* spp. and *Oxyuris equi*; of dogs, *Ancylostoma caninum*, *Dipylidium caninum* and *Toxocara canis*; of cats, *Taenia taeniaeformis*, *Dipylidium* spp. and *Toxocara mystax*; and of fowl, *Raillietina tetragona* and *Ascaridia galli*. Results of the survey on camels, tigers, rabbits, guinea-pigs and rats are also given. An insufficient number of pigs was examined for these results to be included. J.W.S.

(149b) A triple infection of a circus tigress in India, which consisted of eight *Taenia pisiformis*, 13 male and 19 female *Toxascaris leonina* and 90 male and 103 female *Ancylostoma caninum* recovered from the small intestine at post-mortem examination, may have been acquired from circus dogs. J.W.S.

150—Ktavim. Rehovot.

a. MINZ, G. & STRICH-HARARI, D., 1959.—"Inoculation experiments with a mixture of *Meloidogyne* spp. on tomato roots." **9** (3/4), 275–279.

(150a) In pot experiments, tomato seedlings var. Marmande were inoculated with *Meloidogyne javanica*, *M. hapla* and *M. incognita* var. *acrita* either singly or in combination. Examination of the roots when the nematodes were mature showed that more than one species could be present in a single gall. *M. incognita* var. *acrita* was the dominant species in an experiment carried out from June to September but *M. javanica* was dominant during the winter (October to February). *M. hapla* was the least successful in both seasons. M.T.F.

151—Kurume Medical Journal.

a. SHIRAKAWA, M., 1959.—"An experimental study on a new final host of *Gnathostoma spinigerum*." **6** (1), 11–23.
b. OKABE, K. & OBA, N., 1959.—"On the helminthic parasites of cats in the southern part of Fukuoka Prefecture." **6** (1), 36–37.

(151a) Shirakawa reports the successful experimental infection of a *Vulpes vulpes japonica* with *Gnathostoma spinigerum*. G.I.P.

(151b) Of 52 cats examined in Fukuoka Prefecture, 46 were infected with the following helminths listed in order of decreasing frequency: *Toxocara cati* (46·1%), *Taenia taeniaeformis* (28·8%), *Diphyllobothrium mansoni* (28·8%), *Metagonimus yokogawai*, *Clonorchis sinensis*, *Dipylidium caninum*, *Ancylostoma caninum* and *Dirofilaria immitis*. G.I.P.

152—Lotta contro la Tubercolosi. Rome.

a. SANI, A., 1959.—"Cisti da echinococco e tubercolosi polmonare contributo casistico." **29** (12), 1733–1751.

153—Magyar Állatorvosok Lapja.

a. TÖLGYESI, G., 1959.—"Csigairtás klórozott fenolokkal." **14** (3), 87–88. [English & Russian summaries p. 88.]
b. HOLLÓ, F. & KASSAI, T., 1959.—"A juhok dictyocaulosisának orvoslása ciánacethidraziddal." **14** (6), 184–187. [English & Russian summaries pp. 186–187.]
c. FRANK, H. & GÉMESI, G., 1959.—"Ritkább emberi helminthosisok előfordulása Nyugat-Magyarországon." **14** (6), 206–208. [English & Russian summaries p. 208.]
d. SZOTÁCZKY, I. & TÓTH, I., 1959.—"Adatok a fasciolosis elleni védekezés időszerű kérdéseihez." **14** (7), 239–242. [English & Russian summaries p. 242.]
e. LÖRINCZ, F., NEMESÉRI, L. & KRALOVÁNSZKY, U. P., 1959.—"Vizsgálatok a sertésorsófergesség hazai előfordulásáról és gazdasági jelentőségéről. I." **14** (8/9), 257–261. [English & Russian summaries p. 261.]

(153a) The chlorophenol product applied was obtained by chlorinating tar fractions rich in phenols and cresols at 100°C. to 135°C. in the presence of ferric chloride as catalyst and dissolving it in alkalized water. *In vitro* experiments involving immersion of snails (*Galba truncatula*, *Radix peregra*, *Succinea* spp.) into one in one million solutions killed more than 90% within 24 hours. The degree of control was similar to that obtained with the much more expensive pure pentachlorophenol at the same dilution. Spraying with 1 kg. of the product in 10% solution over 1,000 sq.m. of infested area produced a satisfactory control of *Radix peregra* but poor control of *Galba truncatula* and *Succinea oblonga*. I.S.

(153b) A large number of sheep up to one year old showing slight symptoms of infection with *Dictyocaulus* were injected subcutaneously with 0·1 ml. per kg. body-weight of a 15% solution of cyanacethydrazide (Dictycide) (0·015 gm. per kg. active ingredient) once or twice within two days. While a single treatment was unsatisfactory, two injections decreased the extensity of infection by about 50% and the intensity of infection by 80% to 90%. Two successive injections of 0·3 ml. per kg. (0·1 gm. per kg. active ingredient) of a 33% solution of ditrazine phosphate (1-diethylcarbamyl-4-methylpiperazine-phosphate) were equally effective. The latter may also be applied parenterally and is effective against other helminths as well as against *Dictyocaulus* and protostrongylids. I.S.

(153c) Symptoms and treatment are briefly described of *Fasciola hepatica*, *Strongyloides stercoralis* and *Trichostrongylus colubriformis* diagnosed in several cases mainly in children. Fascioliasis was successfully treated with emetine injections but the other infections did not respond well to treatment although piperazine adipate was the most promising. I.S.

(153d) For the treatment of fascioliasis, intramuscular injections of a carbon tetrachloride and liquid paraffin mixture were given at 8 ml. per 100 kg. body-weight to cattle and at 2 ml. per 10 kg. to sheep and goats before grazing in an infected district. Faecal examinations in cattle showed an extens-efficacy of about 86%. Good control of the disease requires, in addition to treatment, the prevention of reinfestation of pasture which may be achieved by proper drainage and by control of snails, especially of the intermediate host *Galba truncatula*. I.S.

(153e) By using the flotation method with concentrated salt solution, *Ascaris* eggs were found in 41% of the faecal samples collected from 6,071 young and adult pigs from various parts of Hungary. *Ascaris* infection was found in 27·9% of 1,061 one-year-old and slightly older pigs examined after slaughter. The incidence of infection in Hungary may thus be estimated at 50% to 60% in piglets and 20% to 30% in adult animals. In piglets artificially infected with 6,000 to 60,000 embryonated *Ascaris* eggs, the body-weight three months after infection increased to 25·25 kg. as compared with 27 kg. in uninfected controls; the weight reached in six months was 59·5 kg. and 61·5 kg. in infected and control animals respectively, and the weight of 61·5 kg. was reached eight days later in pigs receiving slight to moderate infection than in control animals. *Ascaris* apparently impaired the health and development of infected animals at two periods in the life-cycle: at the time of larval migration and during massive invasion of the liver or lungs. I.S.

154—Médecine Tropicale.

a. SANSARRICQ, H., 1959.—"La bilharziose à *Schistosoma haematobium* en Haute-Volta dans la région de Bobo-Dioulasso." **19** (3), 345–349.
b. SCHNEIDER, J. & SANSARRICQ, H., 1959.—"L'activité antibilharzienne du para-amino-phénoxy-1-phtalimido-5-pentane (6.171 R.P.). A propos de 43 observations de bilharziose vésicale à *Schistosoma haematobium*." **19** (4), 412–424.
c. DESPREZ, P., 1959.—"Une localisation rare de filariose oculaire à *Wuchereria bancrofti*. Premier cas malgache de présence de microfilaire de Bancroft dans la chambre antérieure de l'oeil." **19** (6), 687–691.

(154a) Sansarricq extending Marill's survey (1957) of the incidence of *Schistosoma haematobium* in the Upper Volta has discovered new endemic foci in several villages of the cantons of Séguédougou and Santigougou, in the subdivision Bobo-Dioulasso. R.T.L.

(154b) The oral administration of para-aminophenoxy-1-phthalimido-5-pentane (6171 RP) to 43 French West African children and adolescents with mild symptoms of *Schistosoma haematobium* infection caused the bladder pains and discomfort on micturition to disappear and viable eggs to vanish from urine samples in 59% of the cases treated. The total dosages given ranged from 260 mg. to 568 mg. per kg. body-weight. R.T.L.

155—Menara Perkebunan. Batavia.

a. OEI HONG PENG, 1959.—"Beberapa tjara untuk menjaring/mengeluarkan nematoda (tjatjing²)." **28** (7), 131–139, 146. [English summary p. 131.]

(155a) Oei Hong Peng discusses various methods of extracting nematodes from soil and plant material. The extraction efficiency was estimated for the Baermann funnel, a modified version of Oostenbrink's sieve and cotton filter method, and Oostenbrink's soil washing apparatus, by using different soil types to which known numbers of nematodes had been added. None of these methods gave 100% nematode extraction. To obtain an accurate estimate of nematodes in a particular soil type allowance must be made for the extraction efficiency, estimated as described, of the method used. An apparatus of the mistifier type, based on a design by Homeyer, for the extraction of nematodes from leaves is described and discussed. D.J.H.

156—Mikroskopie. Vienna.

a. PIRINGER, W. & PIRINGER, E., 1959.—"Coprokulturen der Eier von *Hymenolepis nana*." **14** (3/4), 85–88.

(156a) The developmental stages of eggs of *Hymenolepis nana* in faeces-charcoal culture are described. A series of eight photographs illustrate the different stages. After 19 days in culture the eggs appeared to degenerate. J.E.D.K.

157—Mitteilungen der Schweizerischen Entomologischen Gesellschaft.

a. KLINGLER, J., 1959.—"Anziehung von Collembolen und Nematoden durch Kohlendioxyd-Quellen." **32** (2/3), 311–316.

(157a) Collembola and the nematode, *Ditylenchus dipsaci*, were attracted in laboratory experiments to a source of carbon dioxide. The author suggests that this may explain how soil-inhabiting animals use carbon dioxide gradients to find food sources such as plant roots or decaying matter. H.E.W.

158—Mitteilungen aus dem Zoologischen Museum in Berlin.

a. HARTWICH, G., 1959.—"Revision der vogelparasitischen Nematoden Mitteleuropas. I. Die Gattung *Porrocaecum* Railliet & Henry, 1912 (Ascaridoidea)." **35** (1), 107–147.

(158a) Hartwich, having examined new and re-examined existing nematode material from birds in Central Europe, reviews *Porrocaecum* and lists the following valid species for Germany: *P. crassum*, *P. ensicaudatum*, *P. semiteres* (syn. *P. heteroura*), *P. ardeae*, *P. spirale*, *P. clerci* (a new record for Germany, syn. *P. tamari*), *P. depressum* (syn. *Ascaris arcuata*), *P. angusticolle* and *P. picae* n.comb. (for the species originally described as *Ascaris* and more recently included in the synonymy of *P. ensicaudatum*). Differential characters which are important are the labial complex, the length of the intestinal caeca and the presence or absence of the caudal alae. A key to the nine species is given and also their descriptions with data on hosts and geographical distribution. G.I.P.

159—Mycologia.

a. DRECHSLER, C., 1959.—"Several Zoopagaceae subsisting on a nematode and on some terricolous amoebae." **51** (6), 787–823.

(159a) Drechsler describes *Euryancale marsipospora* n.sp. (Zoopagaceae) found parasitizing a species of *Rhabditis* from leaf mould in Maryland, U.S.A. The aseptate mycelium develops in living nematodes and soon kills them. The reproductive hyphae grow out through the nematode cuticle and bear colourless, arcuate conidia, 7μ to 9μ long and 1·2μ to 1·6μ wide, having an empty membranous pouch at one end. A.M.S.

160—Nederlands Tijdschrift voor Geneeskunde.

a. SMITSKAMP, H., 1959.—"Helminthiasis." **103** (10), 511–516.
b. BERG, J. A. TEN, 1959.—"Een wormziekte uit de tropen." **103** (11), 594–597.
c. VINKE, B. & VAN DER SAR, A., 1959.—"Ervaringen met dithiazanine, een nieuw wormmiddel." **103** (29), 1477–1478. [English summary.]

(160b) After a brief review of some helminth infections, especially by the Filariidae, a case of onchocerciasis is described in a man who had lived in the Cameroons for six years where neither loaiasis nor onchocerciasis is supposed to occur. The patient had microfilariae of *Acanthocheilonema perstans* in his blood, conjunctivitis and swellings on the occiput. When the latter were excised adult *Onchocerca volvulus* were found inside. The *A. perstans* microfilariae remained unaffected by two courses of hetrazan separated by a course of antrypol. W.K.D.

(160c) 76 persons in Curação suffering from helminthiasis were treated with three 200 mg. tablets of dithiazanine daily for five days, the drug being given at mealtimes. In five children aged between 12 and 16 years the dose was halved. The results were: *Trichuris*, 52 treated 43 successful; *Hymenolepis nana*, six treated all successful; *Strongyloides*, 13 treated, six still negative one month later; only four infections with *Ascaris* were found, all were successfully treated. *Ancylostoma duodenale* was less sensitive to the drug, as of eight persons treated two were still positive after treatment. Side effects, mostly vomiting, occurred in 25 patients and treatment had to be stopped in three. The drug is considered to be useful in the treatment of helminthiasis but side effects may be severe in some persons. W.K.D.

161—New England Journal of Medicine.

a. SPINGARN, C. L., EDELMAN, M. H. & BLACKBURN, M., 1959.—"*Schistosoma mansoni* ova: their demonstration in mucus obtained by digital examination of the rectum." **261** (25), 1281–1282.

162—Northwest Science.

a. SCHELL, S. C., 1959.—"*Cercaria robinsonensis* n.sp. and other schistosome cercariae occurring in the inland empire of the Pacific Northwest." **33** (3), 121–128.

(162a) Five species of schistosome cercariae, *Cercaria physellae* from *Physa gyrina* and *P. propinqua*, *C. elvae* from *Lymnaea stagnalis jugularis* and *Stagnicola palustris nuttalliana*, *C. douthitti* from *S. p. nuttalliana*, *C. huronensis* and *C. robinsonensis* n.sp. from *P. gyrina* were collected from lakes in the north-west Pacific States of the U.S.A. The new species belongs to the "*Ocellata*" group and can be distinguished by its oval yellow body, its long tail stem, its failure to respond to light and its habit of firmly attaching itself to containers. *Trichobilharzia* adults were produced experimentally in White Peking ducklings. R.T.L.

163—Nota Pratica. Stazione di Entomologia Agraria, Firenze.

a. MELIS, G., 1959.—"I nematodi dannosi alle piante agrarie." No. 31, 28 pp.

164—Pflanzenschutz. Munich.

a. HANF, E., 1959.—"Auftreten der Wurmfäule an Rüben durch *Ditylenchus dipsaci* in Süddeutschland im Jahre 1958." **11** (7), 104–105.

(164a) Hanf records heavy attack on sugar-beet in South Germany by *Ditylenchus dipsaci*. Damage has been found in several districts. Fodder-beet is also heavily damaged. It is pointed out that infected beet which remain in the field will allow weeds to become infected and the population will be carried over to the next crop. M.T.F.

165—Philippine Journal of Science.

a. YOGORE, Jr., M. G., CABRERA, B. D., ARAULLO, T. P. & CABALTEJA, E. F., 1959.—"Studies on paragonimiasis. VIII. On the excystation of *Paragonimus* metacercariae." **88** (1), 61–78.

(165a) Yogore *et al.* obtained *Paragonimus* metacercariae from naturally infected *Parathelphusa* (*Barythelphusa*) *grapsoides* for their *in vitro* studies of excystation. The larva escapes through a small opening in the cyst wall by a series of muscular contraction rings passing antero-posteriorly through the body. This process is illustrated by a sequence of photomicrographs. Optimum excystation was obtained at 40°C. and *p*H 9, taking approximately 70 minutes for its completion. Storage of metacercariae in physiological salt solution at 5°C. to 6°C. for 24 hours or for eight weeks both brought about an acceleration of excystation. At 40°C., both an increase in the proportion of excysted metacercariae and an acceleration of excystation were obtained by first holding the metacercariae in a medium of *p*H 3 for three hours. The authors speculate briefly on the implications of their observations on the infection of the definitive host with *Paragonimus*. J.W.S.

166—Polski Tygodnik Lekarski. Warsaw.

a. BARCISZEWSKI, M. & JANECKI, J., 1959.—"Ocena kliniczna zachorowań na włośnicę." [Clinical evaluation of trichinelliasis.] **14** (6), 271–276. [English & Russian summaries pp. 275–276.]

b. KUŹMICKI, R., DZIĘCIOŁOWSKI, Z. & BOROWSKA-KUŹMICKA, J., 1959.—"Przypadek zarażenia przywrą chińską (*Clonorchis sinensis*)." **14** (18), 819–821. [English & Russian summaries p. 821.]

c. JEZIORAŃSKA, A. & ZAPART, W., 1959.—"Dotychczasowe wyniki badań serologicznych w kierunku węgrzycy." **14** (28), 1281–1285. [English & Russian summaries p. 1285.]

(166b) *Clonorchis sinensis* is reported from a 20-year-old Vietnamese student in Poland. G.I.P.

(166c) Blood sera and cerebro-spinal fluids were collected for examination from patients with suspected cysticerciasis. Of 93 sera and 13 C.S.F. tested by the precipitin reaction, 18 and two respectively (a total of 19%) were positive and of 179 sera and 24 C.S.F. tested by the complement fixation reaction 54 (29·5%) were positive. The latter reaction was made with homologous, heterologous and control sera. G.I.P.

167—Popularne Monografie Zoologiczne. Warsaw.

a. STEFAŃSKI, W., 1959.—"Glista ludzka i inne nicienie." No. 8, 114 pp.

(167a) This booklet, in Polish, is one of a series of popular zoological monographs. It contains an account of the detailed morphology, embryology, development, pathology, relationship to the human host, pathogenicity, epidemiology and control of *Ascaris lumbricoides*. The probable free-living ancestor, *Rhabditis strongyloides*, is described, and the systematic position of *A. lumbricoides* and phylogenetic relationships of ascarids are discussed. The booklet concludes with a short systematic review of nematodes. G.I.P.

168—Proceedings of the Alumni Association, Malaya.

a. D'ABRERA, V. ST. E., 1959.—"Tropical eosinophilia. An aetio-pathological study." **12** (1), 31–50.

(168a) D'Abrera lists the many agents which have been suggested as the cause of tropical eosinophilia and critically discusses the conclusions of earlier observers. He is convinced that the syndrome "pulmonary eosinophilia" arises from a multiplicity of causes of which helminths are the commonest, and from a further study of the histology in seven cases he is confirmed in his earlier conclusion (1958) that there is no difference between tropical eosinophilia and Löffler's syndrome except that the former occurs in the tropics while the latter is limited to mid-latitude zones. 12 photomicrographs illustrate the text. R.T.L.

169—Proceedings of the American Society for Horticultural Science.

a. LOWNSBERY, B. F. & THOMASON, I. J., 1959.—"Progress in nematology related to horticulture." **74**, 730–746.

(169a) Lownsbery & Thomason list the known nematode pests of horticultural crops in the U.S.A., their parasitic habit and the gross symptoms they produce. The nematodes are discussed under the crop headings of fruit and nuts, vegetables and ornamentals. There are also sections on the diagnosis of nematode disease and proof of pathogenicity, the manner in which nematodes injure plants, and progress in nematode control. This latter section deals with the exclusion of nematodes from seed beds and nurseries by means of heat or steam treatment and nematicides; pre-planting treatment for reducing nematode populations in the field by soil fumigation; crop rotation; biological control; post-planting treatment for reducing populations, using certain nematicides; and the development of resistant plants. A.M.S.

170—Proceedings of the Iowa Academy of Science.

a. SCHROEDER, P. J. & ULMER, M. J., 1959.—"Host-parasite relationships of *Spirorchis elegans* Stunkard (Trematoda: Spirorchiidae)." **66**, 443–454.

(170a) During the examination of a collection of turtles from north-west Iowa, U.S.A., consisting of 24 *Chrysemys picta belli*, two *Chelydra serpentina*, one *Emys blandingi* and one *Pseudemys scripta elegans*, trematodes of the genera *Heronimus*, *Telorchis* and *Polystomoides*, and nematodes of the genera *Camallanus* and *Spiroxys* were commonly encountered. The acanthocephalan *Leptorhynchoides* was recovered from *Pseudemys scripta elegans*. Since sexually mature *Spirorchis elegans* were recovered from the lymphatics and submucosa of the oesophagus of seven *Chrysemys picta belli*, the diagnosis of the family Spirorchiidae should be extended to include these habitats. *S. scripta* was recovered from the atria of the heart and from washings of the intestinal and oesophageal regions of *C. picta belli*. Two spirorchids, one recovered from the ventricle and the other from the intestinal washings of *C. picta belli*, correspond closely to the descriptions of *S. artericola* given by Ward (1921) and Stunkard (1923). Byrd's key (1923) is inadequate in differentiating *S. artericola* from *S. pseudemyae* and the two species may prove to be synonymous. Two specimens of *S. pseudemyae* from intestinal washings, one from *C. picta belli* and the other from *E. blandingi*, are new host records. Brief notes, illustrated by photomicrographs, are given on the morphology and host-parasite relationships of each species of *Spirorchis*. J.W.S.

171—Proceedings of the Louisana Academy of Science.

a. CORKUM, K. C., 1959.—"Some trematode parasites of fishes from the Mississippi Gulf Coast." **22**, 17–29.

b. THATCHER, V. E., 1959.—"A report on some monogenetic trematode parasites of Louisiana marine fishes." **22**, 78–82.

(171a) Of 111 fishes [110 in a table] representing 35 species from the Mississippi coastal area, 36 fishes representing 17 species [given as 18 species in the author's summary] were found to be infected with 16 species of Digenea. Eight new locality records and one new host record are made. Immature specimens of *Bucephalus* sp. and *Prosorhynchus* sp. were found in *Elops saurus*; *Lintonium vibex* and *Bianium plicitum* in *Lagocephalus laevigatus*; *Nagmia* sp. (to be described later as a new species) and *Distomum fenestratum* in *Dasyatis americana*; *Lepocreadium piriforme* in *Peprilus alepidotus* and *Poronotus triacanthus*; *L. archosargi* in *Archosargus probatocephalus*; *Siphodera vinaledwardsii* in *Obsansus* sp.; *Pseudoacanthostomum panamensis* in *Galeichthyes felis*; *Denosoma* sp., *Stomachicola magna*, *Lecithocladium* sp. and *Lecithochirium floridense* in *Synodus foetens*; *Sterrhurus monticellii* in *Prionotus scitulus*; *Lecithophyllum piriforme* in *Sphyraena guachancho* (new host record) and *Ogcocephalus radiatus*; various unidentified allocreadiids in *Orthopristis chrysopterus*, *Hippocampus hudsonius*, *Mugil curema*, *Hypsoblennius* sp. and *P. scitulus*; and various unidentified hemiurids were found in *P. scitulus*, *Synodus foetens* and *Gobioides broussonettii*. Brief descriptive notes are given on each parasite [although none is figured]. J.W.S.

(171b) *Hexastoma macracanthum* from *Euthynnus alleteratus*, *Microcotyle heteracantha* from *Cynoscion nebulosus*, *Pedocotyle minima* from *Bairdiella chrysura* and *Thoracocotyle crocea* from *Scomberomorus maculatus* collected in the vicinity of Grand Isle, Louisiana, U.S.A., are new locality records. *Dermophthirius carcharini* from *Carcharhinus limbatus* is thought to be a new host and new locality record. *Diplectanum bilobatus* and *Choricotyle cynoscioni* from *Cynoscion nebulosus*, and *Heterobothrium affine* from *Paralichthys lethostigmus* are also recorded. Brief notes are given on each parasite [although none is figured]. J.W.S.

172—Proceedings of the National Academy of Sciences, India. Section B.

a. RAI, P., 1959.—"A redescription of *Pseudodiscus collinsi* (Cobbold, 1875) Stiles and Goldberger, 1910—a common parasite of equines." **29** (4), 201–206.

(172a) A detailed description is given of *Pseudodiscus collinsi*. The only important difference between this species from horses and donkeys and *P. hawkesi* from the Indian elephant is in the position of the testes which in *P. collinsi* are tandem. R.T.L.

173—Proceedings of the Pennsylvania Academy of Science.

a. OGREN, R. E., 1959.—"The nematode *Cosmocercoides dukae* as a parasite of the slug." **33**, 236–241.

b. HERBER, E. C. & MAGILL, R., 1959.—"Trichinosis in Lykens." **33**, 242–247.

(173a) *Cosmocercoides dukae* was found in *Deroceras gracile* in a number of localities and a comparison was made of the infections in two areas—the Vivarium yard at Champaign-Urbana and the shore of Quiver Lake near Havana, Illinois. The nematodes inhabited the respiratory chamber of the mantle, around the shell piece, and adult males, ovoviviparous females, and rhabditiform and filariform larvae occurred together. Ovoviviparous females were found in the oldest infections and primarily in the urban environment. The shell piece in infected snails was irregular and contained many large granular masses at its periphery. The life-cycle is direct; one young slug was infected experimentally. S.W.

(173b) The authors describe an outbreak of trichinelliasis in Lykens. Eight cases occurred of which six were taken into hospital. Biopsy appeared to be the only certain method of diagnosis. The symptoms are described and control methods discussed. S.W.

174—Proceedings of the Royal Society of Edinburgh. Section B.

a. SANDERSON, A. R., 1959.—"Maturation and fertilization in two digenetic trematodes, *Haplometra cylindracea* (Zeder 1800) and *Fasciola hepatica* (L.)." **67** (2), 83–98.

(174a) Sanderson has examined, by the squash technique using either aceto-orcein or a fixative followed by Feulgen, maturation and fertilization in *Haplometra cylindracea* and *Fasciola hepatica*. In both species two polocyte nuclei are extruded although this is very difficult to demonstrate in *F. hepatica* except in half-grown flukes. The egg capsule contains four, rarely five, yolk cells in *H. cylindracea* and about 50 in *F. hepatica*. Spermatogenesis gives rise to a rosette of 32 spermatids which elongate enormously, the head in *F. hepatica* measuring 40μ. From her present observations the author concludes that gynogenesis does not occur in *F. hepatica* as she had suggested earlier [for abstract see Helm. Abs., **22**, No. 117b]; in both species the sperm enters the ooplasm, two pronuclei are formed and fusion occurs. The first cleavage is unequal. The chromosome number in both appears to be 2n=20 although haploid counts of nine and 11 have been observed. The paper is illustrated by line drawings and six plates of photomicrographs. S.W.

175—Proceedings of the Zoological Society of Bengal.

a. MIRZA, M. B. & FAROOQI, H. U., 1959.—"A redescription of *Diplotriaena nagpurensis* Karve, (Nematoda—Filarioidea)." **12** (1), 23–25.

(175a) Mirza & Farooqi redescribe and figure the male and female of *Diplotriaena nagpurensis* from "a large number" of specimens from the body cavities of *Acridotheres tristis*,

Temenuchus pagodarum and *Turdoides turdoides*. *D. nagpurensis* is briefly compared with *D. couturieri* and *D. sialiae* which are also characterized by the absence of caudal papillae. J.W.S.

176—Progresso Agricolo. Bologna.

a. SCOGNAMIGLIO, A., 1959.—"Specie di nematode nuova per l'Italia, l'*Heterodera fici* Kir. 1954." **5** (6), 695–700.

(176a) Scognamiglio has found *Ficus elastica* var. *decora* infected with *Meloidogyne arenaria* and *Heterodera fici*. Kiryanova's description and illustrations of *H. fici* are given. Treatment of the infested soil with Crag Mylone 85W Carbide, 25 days before transplanting the *Ficus* gave much improved growth. The author states that this is the first record of *H. fici* in Italy. [Reprints of this paper, which are paginated separately, are provided with English and French summaries.] M.T.F.

177—Quarterly Journal of Microscopical Science.

a. BRADBURY, S., 1959.—"The botryoidal and vaso-fibrous tissue of the leech *Hirudo medicinalis*." **100** (4), 483–498.

(177a) The cells forming the botryoidal and vaso-fibrous tissues of *Hirudo medicinalis* are cells of the vessel and sinus walls swollen by the accumulation of pigment granules. In the botryoidal tissue the pigment is brown consisting of a masked iron compound. In the vaso-fibrous tissue the pigment is green and does not contain iron but reacts to bile pigment tests. These tissues apparently represent kidneys of accumulation for the iron and the bile pigment which result from the breakdown of the blood taken in as food. These tissues of *Hirudo* appear to be the functional equivalent of the adipose cell in *Glossiphonia*. R.T.L.

178—Queensland Journal of Agricultural Science.

a. COLBRAN, R. C., 1959.—"Strawberry root-knot nematode investigations in Queensland." **16** (4), 365–370.

(178a) *Meloidogyne hapla* is found in most strawberry plantations in Queensland. Colbran has shown by experiment that it causes delayed cropping and lower yields. The nematode was not completely eliminated by warm-water treatments at temperatures of 46°C. to 50°C. for various times. Seven months after treatment there was at least 90% survival of the plants and low root-knot index following treatment at 46°C. or 47°C. for 12–16 minutes, 48°C. for 6–14 minutes, 49°C. for 4–10 minutes or 50°C. for 2–8 minutes. The plants were treated in March; root injury caused delayed fruiting and yields were not increased. Some control of the nematodes was achieved by means of chemical dips but many plants died. Best yields with relative freedom from nematodes were achieved by rooting the runners in 6 in. of sawdust spread around the mother plants. M.T.F.

179—Refuah Veterinarith. Jerusalem.

a. NEUMAN, M., 1959.—"Intestinal parasites of domestic animals in Israel (1948–1958)." Special number pp. 54–57.

(179a) The helminth parasites of domestic animals recorded from Israel are listed and a brief summary, with references, is given of work done on helminthological problems caused by them in that country. *Schistosoma bovis* is the aetiological agent of a debilitating disease of sheep. The greatest incidence of gastro-intestinal helminthiasis in sheep occurs between February and April. W.M.F.

180—Revista de Agricultura. São Paulo.

a. LORDELLO, L. G. E. & MONTEIRO, F. P., 1959.—"Larvas de nematódeos do gênero *Eustrongylides* parasitando 'pintado' do Rio Piracicaba (Dioctophymidae)." **34** (1), 37–40. [English summary p. 39.]

b. CESNIK, R., 1959.—"Nematódeos que parasitam a gloxínia (*Sinningia speciosa* B. & H. Hibr.)." **34** (2), 131–138. [English summary pp. 136–137.]

(180a) Larvae of a *Eustrongyloides* sp. (Nematoda: Dioctophymidae) are recorded as encapsulated in *Pseudoplatystoma corruscans* from the Piracicaba River, São Paulo, Brazil. The larvae were 35 mm. to 58 mm. in length and had a diameter of 527μ to 713μ. The head bore 12 prominent papillae in two circles of six. The definitive host is unknown but it is assumed that it must be an aquatic fish-eating bird. W.M.F.

(180b) The roots and tubers of poorly growing gloxinia plants (*Sinningia speciosa*) were heavily galled by *Meloidogyne javanica*; *Scutellonema boocki* and *Aphelenchoides* sp. were also present. Possible methods for controlling nematodes on gloxinias are briefly mentioned. A key is given to the genera of Hoplolaiminae and also to species found in Brazil. The tails of *S. boocki* had a variable number and arrangement of striations on the lateral field around the scutellum; on some specimens there were more striations on one side of the tail than the other. D.J.H.

181—Revista de Agricultura de Puerto Rico.

a. STEINER, G., 1959.—"Los nemátodos: otra plaga de las plantaciones de caña de azúcar de Puerto Rico." **46** (1), 75–78.

(181a) This is a general article indicating the different kinds of damage which may be caused by nematodes. They are thought to cause loss of yield from sugar-cane plantations in Puerto Rico. Suggestions are given for control by methods of cultivation and the use of nematicides. M.T.F.

182—Revista de Biología Tropical. Universidad de Costa Rica.

a. BRENES, R. R., JIMÉNEZ-QUIRÓS, O., ARROYO SANCHO, G. & DELGADO FLORES, E., 1959.—"Helmintos de la República de Costa Rica XIII. Algunos tremátodos de *Rana pipiens*. Descripción de *Glypthelmins facioi* n.sp." **7** (2), 191–197. [English summary p. 196.]

(182a) *Megalodiscus temperatus* (Stafford, 1905) and *Cephalogonimus americanus* Stafford, 1902, parasitic in *Rana pipiens* are reported for the first time from Costa Rica. The authors agree with Bravo Hollis that *M. montezumae* Travassos, 1936, although accepted by Skryabin (1949) as a valid species is synonymous with *M. temperatus*. *Glypthelmins facioi* n.sp. from *R. pipiens* approaches most nearly to *G. californiensis* (Cort, 1919) but is easily distinguished by the range of the vitelline glands which extend from the bifurcation of the gut to slightly behind the testes. The numerous vitelline follicles (49 to 51) extend both extra-caecally and intra-caecally. R.T.L.

183—Revista Brasileira de Medicina.

a. GOULART, Ê. G., 1959.—"Diagnóstico e tratamento da enterobiose." **16** (11), 756–760. [English summary p. 760.]

184—Revista da Faculdade de Medicina Veterinária. São Paulo.

a. MALHEIRO, D. DE M., CAMPOS, M. S. DE & BENVENUTI, O., 1959.—"Ação do tetracloroetileno (C_2Cl_4) sôbre *Ascaridia galli* (Schrank, 1788)—Nematoda Ascaridinae, parasita de intestino delgado de *Gallus gallus domesticus*." **6** (3), 291–296. [English summary p. 295.]

b. CAMPOS, M. S. DE, CAMPOS, R. & FERREIRA, C. S., 1959.—"Estudo da ação in vitro do hexahidrato de piperazina, do hexilresorcinol e do octilresorcinol sôbre *Ascaridia galli* (Schrank, 1788)." **6** (3), 297–301. [English summary p. 300.]

c. RIBEIRO NETTO, A., 1959.—"Estudo epidemiológico experimental do emprêgo da tiodifenilamina (fenotiazina) na profilaxia da ascaridíase das galinhas." **6** (3), 335–364. [English summary pp. 361–362.]

(184a) Three groups of 30 one-day-old chicks were infected with *Ascaridia galli*. All were treated with tetrachlorethylene in five divided doses to a total of 1·25 ml., given during the pre-tissue phase, tissue phase or post-tissue phase of infection. All were killed on the 36th day.

Three birds out of each of the two first groups became infected while in the third group (where the drug was given from the 26th to 30th day) none became infected. All controls were infected. W.K.D.

(184b) Four adult *Ascaridia galli* were placed in flasks with 100 ml. of saline; 1·0 gm. of the drug to be tested was added to the flasks which were kept at 37°C. The worms were withdrawn after one, two, five, ten, 20 and 60 minutes, washed in saline and kept at 37°C. for 20 hours; they were then placed in a water bath at 45°C. to stimulate activity. Hexylresorcinol killed the worms in one minute, octylresorcinol in two minutes while piperazine did not kill all even after 60 minutes. W.K.D.

(184c) Four groups of one-day-old Leghorn chicks and one control group, each of 15 birds, were infected with *Ascaridia galli*; the four groups were then treated with phenothiazine, given either as crushed tablets or as powder. In three groups the drug was given orally but in the fourth it was placed on the ground. Dosage was equal to 500 mg. daily per head. In one group the drug was given in the ration at the rate of 500 mg. per 100 gm. of ration. Groups of uninfected chicks were put into runs previously occupied by infected chicks to determine if phenothiazine could prevent contamination of the run. It was concluded that continued oral administration of phenothiazine is capable of protecting other chicks raised on infected ground, that this protection is much less if the drug itself is placed on the ground, and that giving the drug in the feed is a very practical method. W.K.D.

185—Revista del Instituto de Salubridad y Enfermedades Tropicales. Mexico.

a. LÓPEZ RICO, A., LOYO DÍAZ, C. & RETOLAZA DÍAZ, T., 1959.—"Terapéutica de la uncinariasis con tetracloretileno emulsionado." **19** (3), 265–270. [English summary p. 270.]
b. MAZZOTTI, L., 1959.—"Encuesta sobre la frecuencia del quiste hidatídico en México." **19** (4), 309–316. [English summary p. 314.]
c. LÓPEZ RICO, A., LOYO DÍAZ, C. & RETOLAZA DÍAZ, T., 1959.—"Asociación tetrachloretileno-piperazina en tratamiento simultáneo de uncinariasis con ascaridiosis. Estudio de 33 casos." **19** (4), 329–334. [English summary p. 334.]

(185a) 35 of 99 schoolchildren were cured of hookworm infection by administration of 0·15 ml. of tetrachlorethylene per kg. body-weight. The drug was mixed with Eumulgin 05 (a non-ionic emulsifying agent) in the proportion of 100: 1 and then with water. These cures included 16 of 76 cases of hookworm associated with ascariasis and eight of 94 cases where it was associated with trichuriasis. There were few cases of dizziness or nausea resulting from the treatment. N.J.

(185b) Although Flores-Barroeta in 1955 reported that hydatid occurred in 75% of the animals slaughtered in Mexico City, a survey among animals slaughtered at the abattoirs of 43 centres in Mexico showed the incidence to be: 0·13% of 247,870 bovines, 1·73% of 415,195 pigs, 0·2% of 640,890 sheep and 0·03% of 316,373 goats. The infection was present in 16 regions. A map is appended showing the distribution. N.J.

(185c) A single dose of 0·15 ml. of emulsified tetrachlorethylene per kg. body-weight (maximum 5 c.c.) was given together with 100 mg. piperazine per kg. (maximum 5 gm.) in a syrup to 33 persons with concomitant ascarid and hookworm infections. 27 of these persons also had *Trichuris trichiura*. The mixture was given without being followed by a purgative and 21 days after the treatment faecal examinations showed that 16 persons were free from hookworm and 18 from *Ascaris*. The efficacy against trichuriasis was 25·9%. N.J.

186—Revista Kuba de Medicina Tropical y Parasitología.

a. LIPPI, M., 1959.—"Ultima contribución sobre la terapéutica de la ancylostomiasis con la asociación hexilresorcinol-tetracloroetileno por instilación duodenal." **15** (7/12), 25–26.
b. BASNUEVO, J. G., 1959.—"Diarrea por *Trichuris trichiura* y por *Strongyloides stercoralis*." **15** (7/12), 26.

c. BASNUEVO, J. G. & KOURÍ, A., 1959.—"Acción antihelmíntica del yoduro de ditiazanina." **15** (7/12), 27–36. [English summary p. 36.]
d. BORGES HERNÁNDEZ, F., 1959.—"Actitud del médico práctico frente a un caso de diarrea del lactante." **15** (7/12), 36–38.
e. BASNUEVO, J. G., 1959.—"Tetracloroetileno y piperacina en el tratamiento combinado de la necatoriasis, la ascariasis y la trichuriasis." **15** (7/12), 38–42. [English summary pp. 40–41.]
f. BASNUEVO, J. G., KOURÍ, A. & ESBER, J., 1959.—"La solución benzo-azúcar-formol (BAF) para la concentración de huevos de helmintos en las heces fecales." **15** (7/12), 42–43.
g. BASNUEVO, J. G. & KOURÍ, A., 1959.—"Terapéutica antiparasitaria. Hymenolepiasis nana." **15** (7/12), 48–49.
h. BASNUEVO, J. G. & KOURÍ, A., 1959.—"Terapéutica antiparasitaria. Botriocefaliasis o diphyllobothriasis." **15** (7/12), 49–52.

(186a) [This is a translation of the paper published in *Arch. ital. Sci. med. trop.*, 1956, **37**, 57–59; for abstract see Helm. Abs., **25**, No. 59a.]

187—Revista de Sanidad e Higiene Pública. Madrid.

a. GALLEGO BERENGUER, J., 1959.—"Parasitismo vermidiano de los múridos españoles. (El papel de estos roedores como reservorios de helmintiasis humanas)." **33** (4/5), 169–208.

(187a) Autopsies of a total of 211 rats and mice, belonging to six species and varieties, in Barcelona, revealed the presence of one trematode, four cestode, nine nematode and one acanthocephalan species. Helminths recorded for the first time in Spain were (i) in *Rattus norvegicus*, *Brachylaemus recurvus* (in one out of 124 examined), *Nippostrongylus brasiliensis* (in 27·41%) and *Moniliformis moniliformis* (in two specimens), (ii) a nematode, provisionally diagnosed as *Syphacia* sp., from one of six *Rattus rattus*. N.J.

188—Revue d'Élevage et de Médecine Vétérinaire des Pays Tropicaux.

a. GRABER, M., 1959.—"La cysticercose bovine. Son importance dans les zones sahéliennes d'élevage de la République du Tchad." **12** (2), 121–143. [English & Spanish summaries pp. 142–143.]
b. GRABER, M., 1959.—"Les parasites des animaux domestiques et sauvages de la République du Tchad. I. Régions du Kanem et du Bahr el Ghazal." **12** (2), 145–152. [English & Spanish summaries p. 152.]
c. MOREL, P. C., 1959.—"Les helminthes des animaux domestiques de l'Afrique Occidentale. Revue." **12** (2), 153–174. [English & Spanish summaries p. 174.]

(188a) Graber reviews the history, morphology, development, diagnosis and differential diagnosis of *Cysticercus bovis* and *C. dromedarii*. He reviews records of distribution throughout the world, in Africa in particular and with special reference to the Republic of Chad. Predilection sites in younger and older animals, modes of infection, immunity, treatment and prophylaxis are discussed. *C. bovis* is recorded in Chad from cattle, zebu, camel, *Gazella rufifrons*, *G. dorcas* and twice from sheep. *C. dromedarii* is recorded from *Damaliscus korrigum*, camels, zebu and a gazelle. In Chad, *C. bovis* has an incidence of 0·4% to 15% in adult cattle, and 15% in younger cattle, with predilection sites in the following order of frequence: tongue, shoulder, heart, psoas muscles, neck, hindquarters, masseters and diaphragm. *C. dromedarii* [cysticercus of *Taenia hyaenae* (Baer, 1924) in the hyena] has an incidence of about 1·1% in the zebu with predilection sites in heart and psoas muscles. A bibliography of 118 references is given. W.M.F.

(188b) This is the first report on a survey of parasites of the domesticated and wild animals of the Republic of Chad and deals with the regions of Kanem and Bahr el Ghazal. Helminths of the horse, ass, zebu, sheep, goat, dromedary and fowl as well as those of *Fennecus zerda*, *Lepus chadensis*, *Numida meleagris*, *Chariotis arabs stieberi* and *Himantopus himantopus* are listed. It is of interest that, up to the present, the author has never encountered any pulmonary nematodes. In the sheep and goat oesophagostomiasis is considered to be the most troublesome condition; in camels *Haemonchus longistipes* infections are serious and *H. contortus* is also contracted from sheep; ascarids are prevalent in zebu calves and *H. placei* and *H.*

contortus, *Bunostomum phlebotomum*, oesophagostomes and paramphistomes are of importance; *Parascaris* and *Gastrodiscus* are troublesome in donkeys and horses respectively and strongyles in equines in general. The climatic background is outlined. [The check-list is too lengthy to lend itself to abstracting in full.] W.M.F.

(188c) Morel has compiled a list of helminths reported from domestic animals in west Africa (including the Ivory Coast, Dahomey, Ghana, Guinea, Mauritania, Senegal, Sudan, Liberia, Niger, Portuguese Guinea and Sierra Leone). The main list is arranged systematically and gives the geographical distribution records together with the author (or publication) and date under the name of the helminth. A second list is of the parasites arranged under their hosts. The list is supplemented by further information collected by the author at the Central Veterinary Research Laboratory at Dakar-Hann. Finally there is a bibliography which only comprises information on geographical distribution; references to literature concerned exclusively with biology or morphology are outside its scope and are not included. W.M.F.

189—Revue de Médecine Vétérinaire.

a. EUZÉBY, J., 1959.—"Prophylaxie des maladies parasitaires du mouton et du boeuf, au pâturage." **110**, 538–555. [English summary pp. 554–555.]
b. EUZÉBY, J., 1959.—"Traitement de la syngamose aviaire par l'aérosolthérapie anthelminthique." **110**, 801–803.

(189a) Euzéby examines the problem of prophylaxis of parasitic diseases of cattle and sheep in European countries. He considers the subject, which covers hepatic distomiasis and gastro-intestinal as well as pulmonary strongylosis, under the following headings: (1) General prophylaxis including (a) the elimination of sources of parasites which could infect pastures—by the isolation, coproscopy and treatment of animals newly brought on to the farm and the sterilization by biothermic methods and by sedimentation of natural manures, especially those originating from abattoirs, (b) the elimination on infected pastures of free-living parasite larvae and of intermediate hosts by drainage, rotation, mechanical means, chemicals, biological agents, etc.; (2) Individual prophylaxis (a) the rational use of infected pastures to avoid the taking-up of infective agents by grazing animals (segregation of age groups, mixed grazing of different species, rotation, hygiene at drinking points), (b) the reinforcement of resistance to helminths by (i) vaccination, (ii) by allowing limited access to infective larvae which are then controlled by anthelmintics administered in such a way that the larvae, while being permitted to stimulate resistance, are not allowed to reach sexual maturity, (iii) by proper feeding. It is impossible to mention all the details in an abstract of this valuable review of the subject, but two items of particular interest are the detailed consideration of quarantine for new arrivals on a farm and of methods of pasture sterilization. W.M.F.

(189b) In the experimental treatment of 35 chicks heavily infected with *Syngamus*, Euzéby used (i) pure Nematox 777 (an emulsion of phenols, pyrethrins and rotenone in a mixture of essential oils of pine and eucalyptus), (ii) Nematox 777 plus 1 per 1,000 of lindane. An apparatus equipped with a heating mechanism capable of producing a true aerosol of which the particles have a diameter of 1μ to 10μ was used. The birds were placed in a receptacle of 0·4 cu.m. capacity and exposed to the aerosol for 20 to 30 minutes four or five times at intervals of two days. After treatment disease symptoms ceased and development and growth proceeded normally. An average faecal egg count of 1,000 e.p.g. was reduced to nil, in some cases as early as after the second exposure. After the final exposure 40% of the worms had been killed; a higher proportion of females than of males was killed; the lethal action of Nematox against the worms was enhanced by the addition of lindane. An exposure of small chicks to aerosol for longer than 20 minutes results in respiratory distress; laying birds may be exposed for up to 30 minutes. The author concludes that this treatment is satisfactory clinically although it does not bring about eradication of the parasite. W.M.F.

190—Revue de Zoologie et de Botanique Africaines.

a. INGLIS, W. G., 1959.—"The systematic position of the nematode genus *Hoplodontophorus*." **59** (3/4), 316–325.

b. FAIN, A., 1959.—"Un nouveau schistosome du genre *Trichobilharzia* dans les fosses nasales du canard nain." **60** (3/4), 227–232.

(190a) *Hoplodontophorus flagellum* (Hemprich & Ehrenberg, 1828) is redescribed. The male is described for the second time since the species was first found. It is shown that the mouth opening is surrounded by three ill defined lips and this, in conjunction with the form of the male tail, the shape of the eggs and the shape of the oesophagus in the larvae is considered to demonstrate oxyurid affinities. The genus *Hoplodontophorus* is, therefore, referred to the subfamily Oxyurinae. *H. obtusa* Ezzat, 1954 is considered to be indistinguishable from *H. flagellum* and to represent a stage in the gravidity of the females of that species. W.G.I.

(190b) *Trichobilharzia duboisi* n.sp. found in the nasal veins of *Nettapus auritus* at Astrida (Ruanda-Urundi) is characterized by the occurrence in the male of long fusiform spines on the wall of the gynaecophoric canal and a large strongly spined area of smaller spines in front of the genital papilla and in the female by the presence on the body of small spined tufts formed of four to six small spines. On re-examination of his types of *T. berghei*, Fain found that he had mistaken for spines very fine warts. In *T. aureliani* the cuticle of the male is not spined but has similar warts although fewer in number, while in *T. schoutedeni* there are no spines but very small round granules. In *T. rodhaini* the female is smooth except for a longitudinal band densely covered with spines, running from a little behind the seminal receptacle almost to the anterior end of the ovary, a feature unique in the genus *Trichobilharzia*. R.T.L.

191—Rivista della Ortoflorofrutticoltura Italiana.

a. GOIDÀNICH, G. & GARAVINI, C., 1959.—"Mortalità di *Saintpaulia jonantha* per infestazione di *Meloidogyne arenaria thamesii*." **43** (9/10), 381–385.

(191a) Severe infection of African violet by the root-knot nematode *Meloidogyne arenaria thamesii* is described and illustrated by photographs. Galls are formed on the roots, and the collar at and above soil level is severely infected, leading to deterioration and death of the plant. It is pointed out that clean stocks may be built up by striking leaf cuttings from uninfected material in sterilized soil. M.T.F.

192—Riz et Riziculture et Cultures Vivrières Tropicales.

a. LAVABRE, E. M., 1959.—"Note sur quelques parasites du riz rencontrés au Cameroun avec mention d'une nouvelle espèce." **5** (1), 37–41. [English & Spanish summaries p. 41.]

(192a) In his account of rice diseases which occur along the banks of the Benoue and Logone rivers in the Cameroons, Lavabre describes the disease caused by *Radopholus lavabri* Luc, 1957 [for abstract see Helm. Abs., **26**, No. 124g]. The nematodes attack the rice roots causing lesions and breakdown of the tissues. Attacked plants turn yellow and the stalks wither; diseased patches extend from a few square yards to a few acres. The description of *R. lavabri* by Luc, 1957, is reprinted in this article. D.J.H.

193—Roczniki Nauk Rolniczych. Seria E. Weterynarii.

a. FAGASIŃSKI, A. & MACHNICKA, B., 1959.—"Benzyna jako środek przeciwrobaczy u lisów srebrzystych." **69** (1), 119–133. [English & Russian summaries pp. 130–133.]

(193a) Petroleum benzine, which had encouraging results against *Toxocara canis* and *Dipylidium caninum* in dogs, was intubated to 38 young silver foxes of 580 gm. to 3,700 gm. body-weight on three occasions, when they reached the age of five to six weeks, nine to ten weeks and again when 17 to 18 weeks old. Each was preceded by 12 hours' fasting and consisted of intubations of 2 ml. to 6 ml. of linseed decoction, 2 ml. to 8 ml. of petroleum benzine and then 2·5 ml. to 8 ml. of castor oil. After each of the three administrations the cubs were cleared

completely of *T. canis* but in the first and second dosing they became reinfected through contact with their mothers. This contact was avoided during and after the third intubation. Before this last experiment the presence of *Uncinaria stenocephala* was also observed in two animals. Single eggs of *T. canis* reappeared three weeks after this treatment. Altogether two cubs and a vixen died through the benzine getting inadvertently into the lungs and one cub died from side effects. The use of benzine had no ill effect on the commercial value of the animals at 22 to 23 weeks of age; as regards pathological changes benzine compared well with chenopodium oil. N.J.

194—Sborník Československé Akademie Zemědělských Věd. Veterinární Medicina.

a. ZENDULKA, M., 1959.—"Hepatitis interstitialis chronica multiplex ve vztahu k hepatosis dietetica u selat." **32** (1), 15–26. [German & Russian summaries p. 26.]
b. BREZA, M. & BELOBRAD, G., 1959.—"K otázke vztahu infekčnej obrny a plúcnej červivosti (metastrongylóz) ošípaných. (Predbežná zpráva)." **32** (1), 27–44. [German & Russian summaries pp. 42–44.]
c. ZAJÍČEK, D., 1959.—"Příspěvek k výskytu a patogenezi žaludeční červivosti u kachen." **32** (2), 133–140. [German & Russian summaries pp. 139–140.]
d. KOUDELA, K., 1959.—"Výsledky jednoletého průzkumu uhřivosti skotu." **32** (6), 441–454. [English & Russian summaries pp. 453–454.]

(194a) Infection of 32 piglets with large numbers of embryonated eggs of *Ascaris suum* showed that histological changes, produced in the liver by migrating larvae, corresponded with those described as hepatitis interstitialis chronica multiplex eosinophilica. There was no case of hepatitis dietetica. N.J.

(194b) The authors have observed a relationship between the occurrence of infectious encephalomyelitis (Teschen disease) and *Metastrongylus* in pigs. Of 621 pigs, in 261 the reason for emergency slaughter was clinically diagnosed as encephalomyelitis and on examination of 133 of these, *Metastrongylus* was found in 47%. In 23 pigs with both the disease and the infection, a histological examination of the central nervous system was positive in 35%, doubtful in 9% and negative in 56%. A pathological central nervous system picture was seen only in 6 out of 20 pigs with clinically diagnosed encephalomyelitis without helminthiasis. Further support for the existence of this relationship is found in the similarity of the seasonal and age dynamics of the two infections and indications of the transference of the virus by *Metastrongylus* larvae in earthworms. G.I.P.

(194c) The two proventricular parasites of ducks in Czechoslovakia, *Echinuria uncinata* and *Tetrameres fissispina*, were shown in the course of one year to infect 2% and 24% of ducks. The symptoms are similar for both infections; the anatomical changes produced are different and have been studied. In general terms, the condition caused by *E. uncinata* can be described as chronic, necrotic, focal proventriculitis and that caused by *T. fissispina* as chronic catarrhal and, later, proliferating proventriculitis. G.I.P.

(194d) 4·47% of 5,322 slaughtered cattle examined during 1958 in Czechoslovakia had cysticerciasis, the infection being generally slight. Details of the distribution of cysts in the carcasses are tabulated. The most frequently affected were animals aged up to one-and-a-half years; it is suggested that sex has an influence on the extent of cysticerciasis. The infection rates were highest in September and lowest at the end and beginning of the year. The recent animal losses at Prague slaughterhouses are estimated at 50 to 65 thousand Czechoslovak crowns. G.I.P.

195—Sbornik Nauchnikh Trudov Semipalatinskogo Zootekhnichesko-Veterinarnogo Instituta.

a. ELIZEEV, K. M. & SHALTIKOV, S. S., 1959.—[Epizootiology and eradication of hydatidosis and coenuriasis of sheep in the Semipalatinsk region.] **2**, 185–195. [In Russian.]
b. ERKINA, N. G. ET AL., 1959.—[Helminth fauna of geese on the collective farm 'Rastsvet' in the Zharminsk district of the Semipalatinsk region.] **2**, 196–208. [In Russian.]

c. RAKHMANOV, A. M., 1959.—[Post-mortem diagnosis of opisthorchiasis in domestic animals in the Semipalatinsk region.] **2**, 226–230. [In Russian.]
d. DOMBROVSKI, A. A., VIDUTS, L. P. & KVYATKOVSKI, V. N., 1959.—[Anatomical basis to surgical treatment of coenuriasis of the spinal cord of sheep.] **2**, 324–331. [In Russian.]

(195b) Geese on a collective farm in the Semipalatinsk region (Kazakh S.S.R.) were infected with *Notocotylus attenuatus*, *Echinostoma revolutum*, *Hypoderaeum conoideum*, *Drepanidotaenia lanceolata*, *Hymenolepis setigera*, *H. longicirrosa*, *Ganguleterakis dispar* and *Capillaria anseris*. The scolex of *H. longicirrosa* has no rostellum or hooks; the four suckers, which cover almost the whole of the scolex, are elongated and the scolex is joined to the neck by a very narrow isthmus. The intermediate host of *Notocotylus attenuatus* was *Lymnaea peregra*. Prophylactic measures eliminated helminth infections on the farm. N.J.

(195c) Seven of 23 dogs and eight of 17 cats in the Semipalatinsk region were shown by autopsy to harbour *Opisthorchis*. Tumours which proliferated from the infected bile-ducts were found in two dogs. Examination of 254 pig carcasses failed to reveal the infection. N.J.

(195d) Dombrovski *et al.* devised a surgical technique for the removal of *Coenurus* from the spinal cord of sheep. The method was used on one animal with success. N.J.

196—Sbornik Nauchno-Tekhnicheskoi Informatsii Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina.

a. BORGARENKO, L. F., 1959.—[Nematodes of domestic birds of Tadzhik S.S.R.] No. 6, pp. 3–5. [In Russian.]
b. VASILEV, A. A. & GARKAVI, B. L., 1959.—[Group treatment of ducks and geese with filixan against cestode infections on collective farms in the Krasnodar Kray.] No. 6, pp. 6–9. [In Russian.]
c. PETROV, A. M. & CHERTKOVA, A. N., 1959.—[Specific diagnosis of the causes of ascaridiasis in turkeys in the U.S.S.R.] No. 6, pp. 10–11. [In Russian.]
d. PETROCHENKO, V. I. & KOTELNIKOV, G. A., 1959.—[Veterinary and helminthological evaluation of water reservoirs with the possibility of their being a source of helminth infections to birds.] No. 6, pp. 12–20. [In Russian.]
e. PETROCHENKO, V. I. & KOTELNIKOV, G. A., 1959.—[Study of the biology of the helminths causing disease in geese and ducks in Khabarovsk Territory.] No. 6, pp. 21–34. [In Russian.]
f. ROMASHCHENKO, E. I., 1959.—[Treatment of cestode infections in chickens.] No. 6, pp. 35–42. [In Russian.]

(196a) Autopsy of 374 domestic fowl, 40 ducks and five geese, carried out in the Tadzhik S.S.R., revealed 19 nematode species 14 of which are recorded for the first time in the republic. N.J.

(196b) *Hymenolepis anatina* and *Fimbriaria fasciolaris* were found in ducks on one collective farm and *F. fasciolaris* on another. Group treatment, preceded by 12 hours' hunger diet, was carried out on ducks and geese, the former receiving 0·35 gm. of filixan per kg. body-weight and the latter 0·45 gm. per kg. given in the food. Some ducks were given the drug in boluses at a dose of 0·3 gm. per kg. In 15 ducks regardless of the method of dosing no cestodes were found on autopsy but they were present in five of ten ducks, in poor condition, given the drug in food. No side effects were observed. N.J.

(196d) Petrochenko & Kotelnikov investigated the helminth fauna of water reservoirs in the Khaborovsk Territory with a view to their use for rearing aquatic fowl. Some reservoirs are recommended for this purpose but others are not. N.J.

(196e) Studies of the biology of helminths causing disease in geese and ducks in the Khabarovsk Territory revealed among other observations that: (i) the first and second moults of *Amidostomum anseris* take place after hatching; (ii) *Mesocyclops crassus*, *M. oithnoides* and *Eucyclops serrulatus* were shown experimentally to be intermediaries of *Drepanidotaenia przewalskii*; (iii) the larvae of *Fimbriaria amuriensis* n.sp. [which is not described] were found in *Sinodiaptomus sarsi*, *M. leuckarti* and *E. serrulatus*; (iv) *Semisulcospira cancellata* is said to be recorded for the first time as first and second intermediate hosts of *Echinostoma revolutum*, and *Radix auricularia* as an intermediate host of *E. paraulum* and *Notocotylus attenuatus*. N.J.

(196f) About 350 domestic fowls, including controls, were used in establishing the efficacy against cestodes of aminoacrichin, lead arsenate, piperazine, a new drug stated to be 2 methoxy-6 chlor-9 aminoacridine, carbon tetrachloride, chlorophos and filixan. Lead arsenate, at doses of 0·1 to 0·15 gm. per kg. body-weight, cured all 36 birds but proved to be toxic. The new drug in doses of 0·3 to 0·5 gm. per kg. failed to cure any of five chickens. It was found that 0·5 gm. per kg. of filixan given in the feed after 12 hours' starvation diet for seven consecutive days, cured all of 13 fowl. It showed no harmful effects even at a dose of 2·5 gm. per kg. (administered individually). N.J.

197—Technical Bulletin. Kansas Agricultural Experiment Station.

a. GIER, H. T. & AMEEL, D. J., 1959.—"Parasites and diseases of Kansas coyotes." No. 91, 34 pp.

(197a) A total of 1,850 *Canis latrans* was autopsied in Kansas during 11 years. Less than 3% were free from gastro-intestinal parasites. Cestodes, mostly *Taenia pisiformis*, were found in 95%, *Dipylidium caninum* and *Mesocestoides corti* each in three animals. The last-named cestode was tentatively identified as *M. lineatus* [for abstract see Helm. Abs., **26**, No. 398dg]. *Toxascaris leonina* was found in 33%, *Physaloptera* in 51% and *Ancylostoma caninum* in 25%. 24 of the animals examined harboured *Trichuris vulpis* and nine *Dirofilaria immitis*. N.J.

198—Technical Bulletin. Ministry of Agriculture, Fisheries and Food. London.

a. STANILAND, L. N., 1959.—"Nematology in perspective." No. 7, pp. 1–6.
b. JONES, F. G. W., 1959.—"An introduction to plant nematology." No. 7, pp. 7–31.
c. SEINHORST, J. W., 1959.—"The genus *Ditylenchus* and related genera." No. 7, pp. 33–43.
d. SEINHORST, J. W., 1959.—"The host range of *Ditylenchus dipsaci* and methods for its investigation." No. 7, pp. 44–49.
e. FRANKLIN, M. T., 1959.—"Root-knot nematodes, *Meloidogyne* spp." No. 7, pp. 49–60.
f. FENWICK, D. W., 1959.—"The genus *Heterodera*." No. 7, pp. 61–64.

(198a) Staniland discusses the historical background of nematology in Great Britain since the early 1920's. H.R.W.

(198b) Jones gives summarized information with simple diagrams on general structure of nematodes, classification of the phylum, feeding in stylet-bearing nematodes and plant injury produced, origins and types of plant parasitism and ends with a list of useful references. J.E.P.

(198c) Seinhorst compares the morphology and host-parasite relationships of the genera *Ditylenchus* and *Anguina*. The genus *Tylenchus* is briefly mentioned. The diversity of host-parasite relationships shown by the genus *Ditylenchus* is reviewed. C.D.B.

(198d) Seinhorst reviews the methods of maintaining cultures of *Ditylenchus dipsaci* races for laboratory use, of inoculating test plants in host range studies and of assessing the results of test inoculations. The range of symptoms produced in host and non-host plants by *D. dipsaci* is reviewed. C.D.B.

(198e) This is a short review of the genus *Meloidogyne* including references to the development and feeding of the nematode, to some morphological characters and to gall formation. A key based on that of Taylor *et al.* gives the distinctive characters for the female cuticular patterns and a table sets out the chief differences between the genera *Meloidogyne* and *Heterodera*. M.T.F.

(198f) This is a brief summary of the general life-history and host-parasite relationships in the genus *Heterodera*, with the main host crops of the more common British species. A.M.S.

198—Technical Bulletin. Ministry of Agriculture, Fisheries and Food. London. (cont.)

g. HESLING, J. J., 1959.—"The identification of *Heterodera* cysts." No. 7, pp. 64–70.
h. FRANKLIN, M. T., 1959.—"Plant-parasitic nematodes of the genus *Aphelenchoides* Fischer, 1894." No. 7, pp. 71–77.
i. PITCHER, R. S., 1959.—"*Pratylenchus* spp. and other migratory soil nematodes." No. 7, pp. 77–87.
j. THOMPSON, H. W., 1959.—"Potato root eelworm." No. 7, pp. 89–95.
k. ROLFE, S. W. H., 1959.—"Cereal root eelworm." No. 7, pp. 95–100.
l. JONES, F. G. W., 1959.—"Beet eelworm and other root eelworms." No. 7, pp. 100–114.
m. FENWICK, D. W., 1959.—"Estimation of eelworm populations: principles and techniques." No. 7, pp. 115–118.
n. FENWICK, D. W., 1959.—"Root diffusates and the hatching process in *Heterodera* spp." No. 7, pp. 119–122.

(198g) Cysts of *Heterodera* spp. may be identified by their general shape in conjunction with certain features of the vulval cone. These characteristics are described in detail, illustrated with photographs and diagrams and the terminology elaborated. The technique for preparing and mounting vulval cones is described. The diagrammatic illustrations of the more common British species are arranged in the form of a simple key and there are also descriptions of species not normally found in Britain. A.M.S.

(198h) The commoner plant-parasitic species of *Aphelenchoides* are dealt with and the morphological characters distinguishing them are tabulated. Symptoms of disease caused by them are briefly given. M.T.F.

(198i) Pitcher in an illustrated review describes the occurrence, economic importance, symptomatology, aetiology, control measures and taxonomy of *Pratylenchus* spp. and other genera of plant-parasitic nematodes with a similar migrating habit. C.D.B.

(198j) Thompson gives distribution maps of *Heterodera rostochiensis* on potatoes and tomatoes in Great Britain and describes the symptoms in these hosts. He describes how infestation is spread through using seed potatoes from an infested crop, by wind and flood water, with transplants, in infested clamp sites and on implements. Control measures on infested land and in tomato houses are discussed. A.M.S.

(198k) The history of cereal root eelworm, *Heterodera major* Schm. (syn. *H. avenae* Woll.), is given and its life-history and distribution discussed, together with host susceptibility and factors contributing to outbreaks of the disease. Cereal root eelworm is normally present in low populations in most British soils and is thought to be indigenous. Dangerous population levels are only reached in certain, mainly light, soil types. Inefficient hosts, e.g. certain grasses, are more effective in lowering population levels than non-hosts. A.M.S.

(198l) Jones describes the symptoms, distribution and problems raised by *Heterodera cruciferae*, *H. carotae*, *H. göttingiana* and *H. schachtii*. In addition acreages of host crops grown, effects of cropping on beet eelworm populations and methods of keeping infestations in check are reviewed. J.E.P.

(198m) Methods of sampling soil for eelworms for scientific and advisory purposes and for establishing presence or absence are discussed. Fenwick stresses the importance of expressing the population density of *Heterodera* spp. as eggs or larvae per gm. of soil and not in terms of cysts or "viable" cysts. The significance of the Poisson error in the number of individuals in the samples and in the variability of numbers of eggs and larvae within the cysts is described. Uneven distribution of the cysts within a field also presents another source of error. H.R.W.

(198n) Fenwick briefly surveys hatching responses in various species of *Heterodera* and discusses in a little more detail the factors influencing hatch in potato root eelworm, *H. rostochiensis*, and the techniques used with this species. A.M.S.

198—Technical Bulletin. Ministry of Agriculture, Fisheries and Food. London. (cont.)

o. WIDDOWSON, E., 1959.—"The conduct of hatching tests." No. 7, pp. 123–126.
p. WALLACE, H. R., 1959.—"The influence of soil conditions on larval emergence and movement." No. 7, pp. 127–133.
q. PETERS, B. G., 1959.—"Principles of chemical control, with special reference to soil fumigation." No. 7, pp. 135–140.
r. STANILAND, L. N., 1959.—"Contact nematicides." No. 7, pp. 141–147.
s. STANILAND, L. N., 1959.—"The principles of the hot-water treatment of plants." No. 7, pp. 147–156.
t. HOWARD, H. W., 1959.—"Eelworm-resistant potatoes—the present position." No. 7, pp. 157–160.
u. NICHOLAS, W. L., 1959.—"The cultural and nutritional requirements of free-living nematodes of the genus *Rhabditis* and related genera." No. 7, pp. 161–168.

(198o) Widdowson sets out the techniques developed for hatching tests with *Heterodera rostochiensis*, including the collection of cysts, the setting up of tests and the counting of hatched larvae and residual eggs. The sources and magnitude of errors are also discussed. A.M.S.

(198p) The influence of temperature, soil structure, soil moisture and soil aeration on the emergence of larvae from cysts of the beet eelworm and their subsequent migration are briefly described. H.R.W.

(198q) Peters discusses the chemical control of eelworms under four headings: (i) the infesting eelworms; (ii) the infested material; (iii) the disinfesting process and (iv) the economics of the process. The difficulties of chemical control are emphasized in the way these four factors interact. H.R.W.

(198r) Staniland describes the results of laboratory and field experiments with liquid nematicides and discusses their penetration into the soil. The use of liquid nematicides as seals for the surface layer of the soil after injection with D.D. and practical notes on the treatment of glass-house soils are also described. H.R.W.

(198s) Hot-water treatment is discussed under the following headings: (i) time and temperature killing curves; (ii) the penetration of heat into plant material; (iii) the requirements for an efficient bulb hatch; (iv) the killing of eelworms by heat; (v) the after treatment of bulbs on removal from the bath; (vi) further work on the hot-water treatment of bulbs; (vii) home-made baths and (viii) the hot-water treatment of chrysanthemum stools and strawberry runners. H.R.W.

(198t) This is a brief review of the history and progress of breeding potatoes resistant to *Heterodera rostochiensis* Woll. Howard defines the type of resistance and describes the purpose and results of field experiments on population dynamics under resistant and susceptible varieties and under fallow, and on the yields of resistant plants. Resistance-breaking biotypes and the genetics of resistance are also discussed very briefly. A.M.S.

(198u) Agnotobiotic cultures of *Rhabditis* and related genera can be maintained in a variety of putrefying materials, such as human faeces or pieces of rotting meat, and also in a nutrient agar containing meat and yeast extracts. Several species of these nematodes show a wide tolerance to the *p*H of the media and also to changes in osmotic pressure. Methods of obtaining axenic nematodes are reviewed and details given of tests for contaminating organisms. Monoxenic cultures can be obtained using one of several species of bacteria; the nematodes, however, die in anaerobic conditions. Axenic cultures can be maintained in media containing autoclaved liver extract to which has been added one of several types of unheated extract. Details are given for the preparation of these media. D.J.H.

198—Technical Bulletin. Ministry of Agriculture, Fisheries and Food. London. (cont.)

v. DOUGHERTY, E. C. & HANSEN, E. L., 1959.—"Test procedures used in nutritional studies of *Caenorhabditis briggsae*." No. 7, pp. 169–170.

(198v) The equipment and material necessary for setting up an experiment for the nutritional studies of *Caenorhabditis briggsae* are described. Details are given for obtaining sterile egg masses. Individual larvae obtained from the egg masses are inoculated into test media in tubes which are then sealed. The tubes are examined at regular intervals to determine maturation of the original inoculation and of the F_1 generation. In deficient media the nematodes either fail to mature or mature slowly and produce few offspring. D.J.H.

199—Tierärztliche Umschau.

a. ISELI, R., 1959.—"Eine praktische und hochwirksame Lungenwurm-Therapie." **14** (9), 313.
b. ASSEN, H. VON DER, 1959.—"Beitrag aus der Praxis zur Behandlung lungenwurmverseuchter Rinder mit Insol^R." **14** (9), 314–316.
c. BAMBAUER, H., 1959.—"Zum Vorkommen des Rinderlungenwurmes (*Dictyocaulus viviparus*) in der Pfalz und seine Bekämpfung." **14** (9), 316–317.

(199a) Broverma, a 25% solution of cyanacethydrazide, is recommended for the easy treatment of lungworms in cattle (dose 20 c.c., subcutaneously), sheep, goats and pigs (dose 4 c.c., subcutaneously). G.I.P.

(199b) From the results of a number of experiments on the Insol (cyanacethydrazide) treatment of lungworms in 39 cattle (infected also with gastro-intestinal worms), the following dose regimens are suggested: (i) animals with low lungworm infections should be given one Insol injection of up to 18 c.c. according to age and phenothiazine (or Nemanex) according to weight; (ii) animals with medium infections should receive either one injection on each of two consecutive days and the 10% Insol powder orally on the third day, or the injection and phenothiazine on the first day and the powder on two following days; housing the animals for 8 to 14 days is recommended; (iii) heavily infected animals should be housed and those with fever examined for pneumonia and treated with antibiotics or sulphonamides. The Insol treatment consists of two injections on two consecutive days and Insol powder on the two following days. Phenothiazine should be given on the second day of the treatment. If no improvement is seen after eight days, the animals are treated again. The Insol powder, which in its new composition contains phenothiazine as well as a higher concentration of cyanacethydrazide, was given in water. G.I.P.

(199c) A heavy outbreak of dictyocauliasis is reported in a herd of 380 cattle in the Pfalz in 1958 (for the first time in this area). Treatment with injections of Insol (cyanacethydrazide) in the recommended dose of 3 c.c. per 50 kg. body-weight up to a maximum of 18 c.c., was ineffective even after three injections. The loss of the animals was finally checked and a high degree of cure effected by the administration of ascaridole aerosol. G.I.P.

200—Transactions of the American Fisheries Society.

a. HOFFMAN, G. L., 1959.—"Studies on the life cycle of *Apatemon gracilis pellucidus* (Yamag.) (Trematoda: Strigeoidea)." **88**, 96–99.

(200a) Hoffman found tetracotyliform metacercariae of *Apatemon gracilis pellucidus* encysted in the musculature of brook sticklebacks (*Eucalia inconstans*) in North Dakota, this being the first record of this parasite in North America. A tail-like structure, which was nearly always present on the cysts, is illustrated by a photomicrograph. Adult worms were recovered from the intestine of chicks 3 to 12 days after being fed the cysts. The metacercaria and adult are described and figured. The author found no distinct morphological differences between the North Dakotan specimens and the description of *Apatemon pellucidus* Yamaguti, although

there appeared to be a few vitelline follicles in the fore-body. Attempts to infect *Physa anatina*, *Stagnicola palustris* and *Helisoma anceps* with miracidia from the experimentally raised flukes were unsuccessful. J.W.S.

201—Transactions of the Wisconsin Academy of Sciences, Arts and Letters.

a. GUILFORD, H. G., 1959.—"Some helminth parasites found in turtles from northeastern Wisconsin." **48**, 121–124.

(201a) 12 trematode species and three nematode species were found as single or multiple infections in a survey of 54 *Chrysemys picta*, six *Chelydra serpentina*, two *Clemmys insculpta* and one *Emys blandingi* collected from various localities in north-eastern Wisconsin, U.S.A. Leeches were abundant but were not collected. The turtle hosts, their geographical location and the number of animals infected with each species of helminth are given in a table. *Dictyangium chelydrae* in the cloaca of *C. insculpta* is both a new host and a new locality record. J.W.S.

202—Trudi Alma-Atinskogo Zooveterinarnogo Instituta.

a. VSEVOLODOV, B. P., 1959.—[The principal stages in the development of pathological morphology due to helminthiases.] **11**, 249–252. [In Russian.]

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR.

a. SKRYABIN, K. I., 1959.—[Origin and development of helminthological science in the U.S.S.R.] **9**, 5–7. [In Russian.]
b. AKRAMOVSKI, M. N., 1959.—[The treatment of dictyocauliasis in horses.] **9**, 8–9. [In Russian.]
c. ALTAEV, A. K., 1959.—[The helminth fauna of sheep and goats in Dagestan A.S.S.R.] **9**, 10–14. [In Russian.]
d. ALTAEV, A. K., 1959.—[Individual variations of the dorsal ray in *Marshallagia marshalli* (Ransom, 1907).] **9**, 15–16. [In Russian.]

(203b) Dictyocauliasis was completely cured in 17 horses by injecting intratracheally 180 c.c. of iodine solution and repeating this after three to six days. One treatment caused bronchopneumonia in three and pulmonary gangrene in one heavily infected horse. 100% efficacy was obtained in foals with 0·5 to 0·6 c.c. of iodine solution per kg. body-weight given as a single intratracheal injection. By using methylene blue it was shown that intratracheal injections were better distributed when given while the animals lay on their backs at an angle of 25° to 30° than when they lay strictly horizontally. Inhalations of iodine vapour, even if preceded by lobeline, failed to give complete cures in 15 horses. *Dictyocaulus* infection could remain for up to two years in horses in poor physical condition but did not last for more than a few months in animals in good condition. *D. arnfieldi* larvae disappeared from the faeces of horses within one-and-a-half to two months when their condition had been restored by adequate feeding and complete rest. N.J.

(203c) Autopsies of sheep and goats in the Dagestan A.S.S.R. revealed the presence of four trematode, seven cestode and 29 nematode species. Nine to 19 helminth species were found per infected animal. The degree of infection was highest in the mountain zone. In all three zones, i.e. mountain, plain and mountain-valley, sheep were twice to three times as heavily infected as goats but fascioliasis was found only on the plains. *Eurytrema pancreaticum* from sheep and goats and *Capillaria bovis* from sheep only are recorded for the first time in the Caucasus. N.J.

(203d) In 96·75% of 800 specimens of *Marshallagia marshalli* collected from sheep in Dagestan, the dorsal ray was normal and of the shape originally described by Ransom. In the remainder variations in the relative length of the branches and in the degree of branching were observed and are described and figured. G.I.P.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

e. ANIKINA, V. V., 1959.—[The determination of the viability of helminth eggs by fluorescent microscopy.] **9**, 17–19. [In Russian.]
f. ASADOV, S. M., 1959.—[A new trichostrongylid, *Marshallagia petrovi* n.sp., from the abomasum of sheep.] **9**, 20–22. [In Russian.]
g. AKHMEROV, A. K., 1959.—[Acanthocephala from fish of the river Amur.] **9**, 23–44. [In Russian.]
h. AKHMEROV, A. K., 1959.—[A new trematode genus from fish.] **9**, 45–48. [In Russian.]
i. BELYAEVA, I. V., 1959.—[The nematode fauna of the principal types of soil in the Kara-Kalpak A.S.S.R.] **9**, 49. [In Russian.]

(203e) Acridine orange NO, used in fluorescent microscopy in concentrations of 1: 10,000 to 1: 50,000, imparted a dull dark green or grey-green fluorescence to living embryos of *Ascaris lumbricoides*, *Toxascaris leonina*, *Enterobius vermicularis*, *Hymenolepis diminuta*, *Taenia saginata* and *Diphyllobothrium latum*. Embryos killed with a 10% solution of carbolic acid, or by the presence of sodium chloride in the faeces, were no longer fluorescent. The other compounds tested were: acriflavine, rivanol, berberine sulphate, primulin and acrichin but acridine orange NO was the most effective. N.J.

(203f) Re-examining material of *Marshallagia* from different parts of the U.S.S.R., Asadov found, in that collected in 1931 from sheep in the Buryat Mongol A.S.S.R., a new species which he describes as *M. petrovi* n.sp. The new species differs from all known species of *Marshallagia* in that the medio-ventral and medio-dorsal processes of the spicules are equally thin and sharply pointed. G.I.P.

(203g) Of 55 fish species collected during five summers between 1936 and 1954 in the Amur river basin, 28 were infected with Acanthocephala. These were *Neoechinorhynchus rutili*, *Echinorhynchus gadi*, *Bolbosoma caenoforme* (the juvenile of *B. nipponicum*), *Acanthorhynchoides ussuriensis* (syn. *Hemigyrus intermedius*), *Bolborhynchoides exiguus* n. comb., *Paracanthocephalus tenuirostris*, *P. curtus*, *Pseudoechinorhynchus lenok*, *Echinorhynchoides dogieli*, *Acanthocephalus parallelotestis*, *Pseudorhadinorhynchus markewitschi*, *P. pseudaspii* and an unidentified larva from *Ophicephalus argus*. All (but the first three) are described and figured; they are principally species described by the author jointly with Dombrovskaya-Akhmerova in 1941 in *C.R. Acad. Sci. U.R.S.S.*, **31** (5), 517–520. Emended diagnoses are given for *Acanthocephalorhynchoides* (syn. *Hemigyrus*), *Paracanthocephalus*, *Echinorhynchoides*, *Pseudorhadinorhynchus* and *Bolborhynchoides*, which is a *nomen novum* for *Bolborhynchus*, a name preoccupied by Porta's (1906) genus. The acanthocephalan fauna of Amur fish is rich in species (12 as compared with a total of 29 reported from other parts of the U.S.S.R., only three species being common to both European and Siberian areas), many of which are endemic, and includes a number of forms intermediate in position between the Neoechinorhynchidae and Rhadinorhynchidae. A further 11 species are listed which have been reported from Japan and China on fish also occurring in the Amur area. G.I.P.

(203h) *Amurotrema dombrowskajae* n.g., n.sp. is described and figured from 14 of 46 *Ctenopharyngodon idella* in the Amur river. It is nearest to *Ophioxenos dienteros*, *Neocladorchis poonaensis* and *Diplodiscus subclavatus* but differs from these in the genital bursa, which lies anterior to the intestinal bifurcation and almost at the base of the diverticula of the oral sucker; the two rounded testes (they may be lobed in older specimens), which measure 0·67 × 0·75 mm. (anterior) and 0·63 × 0·68 mm. (posterior); the thick short intestinal caeca; the absence of a genital sucker; the 20 to 22 vitelline follicles, which cover the lateral areas from the beginning of the posterior testis to the end of the ovary; and in the posterior, nearly terminal, ventral sucker. The new genus is diagnosed and is placed in the Schizamphistomatinae (Diplodiscidae), the diagnosis of which is emended. G.I.P.

(203i) Examination of the principal soils of the Kara-Kalpak A.S.S.R. showed the absence of nematodes in salt-marsh soils. Nematodes were found in: (i) five out of 30 samples of marsh soils (*Dorylaimus filiformis*); (ii) 61% of 34 samples of meadow soils (fallows); (iii) all 18 samples of cultivated, irrigated soils; and (iv) all 30 samples of sandy (semi-stabilized) soils. In the last three types of soil 20, 24 and 28 nematode species respectively were observed. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

j. BOLKHOVITINOV, D. Z., 1959.—[Reaction of sheep to superinfections with *Dictyocaulus*.] **9**, 50–53. [In Russian.]
k. BULIGINSKAYA, M. A., VLADIMIROV, V. L. & MARKOV, G. S., 1959.—[Helminths of jirds in Uzbekistan, with a description of a new filariid genus and age and seasonal changes in the helminth fauna of *Rhombomys opimus*.] **9**, 54–58. [In Russian.]
l. BIKHOVSKAYA-PAVLOVSKAYA, I. E., 1959.—[Some characteristics of the geographical distribution of trematodes of birds in the U.S.S.R.] **9**, 59. [In Russian.]
m. VASILKOVA, Z. G., 1959.—[The use of sewage irrigation in fields and its sanitary and helminthological significance.] **9**, 60–64. [In Russian.]
n. VOZNAYA, A. T., 1959.—[The laboratory diagnosis of cysticerciasis of the central nervous system.] **9**, 65–66. [In Russian.]
o. GAIBOV, A. D., 1959.—[Treatment of domestic fowls against *Ascaridia*, *Heterakis* and cestode infections with arecoline and phenothiazine.] **9**, 67–68. [In Russian.]
p. GARKAVI, B. L., 1959.—[Treatment of dictyocauliasis of sheep in four districts of the Krasnodar Territory.] **9**, 69–70. [In Russian.]

(203j) *Dictyocaulus filaria* larvae were given to 12 sheep, three months to seven years old, which had already been naturally or experimentally infected. The animals were reinfected one to eight times at intervals of 32 to 120 days. It was concluded that: (i) the disappearance of adults from the lungs was directly proportional to the number of larvae given at reinfection, to the age of the animal and to the intensity and duration of the preliminary infection; an analogous process was observed with immature and larval forms; (ii) complete resistance to superinfection was not observed; (iii) superinfection did not intensify the disease; (iv) when development to sexual maturity did take place the time required was considerably longer. N.J.

(203k) In a survey of over a thousand jirds in Uzbekistan, the helminths *Catenotaenia rhombomydis*, *Hydatigera krepkogorskii*, *Paracanthocheilonema vite* n.g., n. comb. and *Trichuris rhombomydis* were found in *Rhombomys opimus* and *Meriones erythrourus*, and the first three and *Physaloptera massimo* in *M. meridianus*. *M. erythrourus* and *M. meridianus* represent new host records. *Paracanthocheilonema* is erected for *Litomosa vite*, the males of which are described here for the first time. It is differentiated from other filariinid genera chiefly by the trifid tail, the presence of anal alae and papillae in the male, a smooth cuticle and the presence of a buccal capsule but the absence of a spine at the base of the oral cavity. The age dynamics of the various infections in *R. opimus* and the seasonal dynamics in one of the age groups from the Guzarsk area were also studied. G.I.P.

(203l) 485 trematode species have been reported from birds in the U.S.S.R., parasitizing 303 species. There is no sharp differentiation in the bird fauna in the various zones. The trematode fauna is characteristic of a given zone and also shows characteristic features in different biotopes. The same host species frequently has a different parasite fauna in different places. N.J.

(203n) Examination of the cerebro-spinal fluid was found useful in diagnosing cysticerciasis of the central nervous system. Many clinically suspected cases were examined by complement fixation tests using an antigen prepared from cysticerci from pigs and only a few gave incorrect results. It is concluded that exact diagnosis of this condition can only be made when clinical and laboratory data coincide. N.J.

(203o) *Ascaridia* and *Heterakis* infections were treated in 25 fowls with 2 to 10 gm. of phenothiazine and/or 4 to 30 mg. of arecoline, given after 15 to 18 hours' starvation. The effect of the treatment was good. Ten other fowls, which also had *Raillietina*, were treated similarly with 2 gm. of phenothiazine and 4 mg. of arecoline. Good results were obtained. The mass treatment of 13,500 fowls with both drugs reduced the incidence of helminthiasis from 70% to 12%. N.J.

(203p) The mass treatment of sheep for dictyocauliasis consisted of intratracheal injections [the drug used is not mentioned], repeated after five days. One or two treatments, combined with change of pastures, reduced the incidence of the disease. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

q. GELLER, E. R., 1959.—[The biology of *Drepanidotaenia lanceolata*.] **9**, 71–72. [In Russian.]
r. GERBILSKI, V. L. & BOGDANOVICH, V. V., 1959.—[Larval ascariasis as an allergic disease.] **9**, 73–75. [In Russian.]
s. GRIGORYAN, G. A., 1959.—[New data on the clinical symptoms and treatment of sheep in experimental *Fasciola gigantica* infections.] **9**, 76–78. [In Russian.]
t. DAVTYAN, E. A. & AKOPYAN, V. D., 1959.—[A change in the level of vitamin A in sheep in experimental fascioliasis.] **9**, 79–81. [In Russian.]
u. DAMANSKAYA, L. Y., 1959.—[The control of *Ditylenchus phloxidis*.] **9**, 82–86. [In Russian.]
v. DANILIN, V. F., 1959.—[Some characteristic features in the treatment of fascioliasis and dictyocauliasis in cattle.] **9**, 87–88. [In Russian.]
w. DEMIDOV, N. V., 1959.—[Difluorotetrachlorethane (Freon-112) in the mass treatment of fascioliasis in sheep.] **9**, 89–90. [In Russian.]

(203q) Oncospheres of *Drepanidotaenia lanceolata* were shown to be surrounded by four permeable membranes; in water they remained alive for up to 26 days but out of water died within five to six minutes. The cysticercoids completed development in cyclops within 12 to 18 days; cyclops with 10 to 15 cysticercoids died several days after infection but those with five or six remained alive for a month or longer. Cysticercoids in dead cyclops or of those freed by the disintegration of the intermediary remained alive for six to ten days. Under natural conditions the number of cysticercoids did not exceed four or five per individual; the average incidence was 9·3% in the foci of infection in the Kursk region. N.J.

(203r) On the basis of numerous experiments, Gerbilski & Bogdanovich conclude that larval ascarid infection causes an allergic disease; they describe the process of migration of the larvae and pathological changes in the lungs, liver and intestine which it causes in experimentally infected rodents. N.J.

(203s) Acute, sub-acute and chronic fascioliasis were observed in 18 sheep experimentally infected with *Fasciola gigantica*. Depression of glycogen formation and disturbance of the pigmentary function of the liver were observed among other results of the infection. The simultaneous administration of 0·1 gm. of hexachlorethane per kg. body-weight *per os* and 1 ml. of carbon tetrachloride into the rumen completely cured all five sheep within five or six days. 100% efficacy was also obtained when 1·5 gm. of hexachlorethane, dissolved in 2 ml. of carbon tetrachloride, was introduced into the rumen. The same solution had a low efficacy when applied subcutaneously. N.J.

(203t) The vitamin A level was lowest in the livers of sheep infected with larvae of *Fasciola gigantica* obtained from *Lymnaea peregra* and *L. truncatula* and was higher in those animals infected with the larvae from *L. auricularia*; the level was highest in sheep infected with *F. hepatica* and in this case it fell sharply 60 to 70 days after infection. The weight of the liver also increased according to the virulence of parasites and in sheep infected with *F. hepatica* it was comparable to that of uninfected animals. N.J.

(203u) *Ditylenchus phloxidis* were subjected *in vitro* to the action of a saturated solution of barium chloride. The dehydration of untreated nematodes took up to 17 hours and 56 minutes longer than the dehydration of nematodes which had been treated with parathion. It is concluded that parathion may affect the eelworm cuticle and thus have a direct contact action against them. N.J.

(203v) The incidence of fascioliasis rose from 5·82% to 45% in 20 grazing cows while it ranged from 1% to 6·4% among 100 cows kept off pastures. Five experimental calves all acquired dictyocauliasis on a pasture infected with larvae which had survived the winter. N.J.

(203w) Two flocks totalling 1,120 sheep, with an incidence of fascioliasis of 17% and 48% respectively, were treated with difluorotetrachlorethane. The drug was injected into the rumen at doses of 8 to 10 ml. per animal. The treatment was well tolerated and side effects (nervous symptoms and depression) quickly passed; they were more evident in 200 sheep which had been kept on a hunger diet for 20 hours. Ten days after treatment *Fasciola* eggs were completely absent from the faeces of 40% of the infected animals. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

x. EFREMENKO, V. P., 1959.—[The potato-root eelworm and its control in the Lithuanian S.S.R.] **9**, 91–92. [In Russian.]
y. ZEMLYANSKAYA, A. I., 1959.—[The distribution of the root-knot nematode in several areas of Uzbekistan.] **9**, 93–94. [In Russian.]
z. IVASHKINA, E. E., 1959.—[*Thelazia* in the eyes of horses in the Mongolian People's Republic.] **9**, 95–96. [In Russian.]
ba. IVASHKIN, V. M., 1959.—[Epizootiology of *Parabronema* infections in ruminants.] **9**, 97–105. [In Russian.]
bb. IVASHKIN, V. M., 1959.—[The treatment of *Thelazia* infections in cattle.] **9**, 106–108. [In Russian.]
bc. IVASHKIN, V. M., 1959.—[The life-cycle of *Gongylonema problematicum* Shults, 1924.] **9**, 109–112. [In Russian.]

(203x) Chloropicrin was effective under experimental conditions against *Heterodera rostochiensis* in doses of 12 c.c. per 30 kg. of soil. It was also effective under field conditions in doses of 96 to 192 c.c. injected to a depth of 17 cm. and 25 cm. apart, the soil subsequently being covered with mulched paper. This treatment freed the soil from the nematode within 30 days; 96 c.c. per sq. m. were also effective. 3% and 5% solutions of caustic soda, in doses of 201 to 251 c.c. per sq. m., failed to destroy the nematode. Crop rotation and fallowing reduced the infection of the soil by 29% to 79·4% by the end of the first growing season. N.J.

(203y) Of 109 farms examined in Uzbekistan only eight, situated in the Tashkent area, were free from root-knot nematodes. Of 34 crops examined the most heavily infected were carrots, tomatoes, cowpeas and mung beans. Eleven weeds which showed heavy infections are listed. G.I.P.

(203z) *Thelazia lacrymalis* was found in 12·23% of 258 eyes of horses examined at the Ulan Bator meat-packing station in November. All females were mature; this, and the fact that most clinical symptoms appear during July and August, suggest that in Mongolia the seasonal development of the parasite in horses coincides with its development in cattle. N.J.

(203ba) A more detailed account of studies of *Parabronema skrjabini* infection is given. [For abstract of earlier account see Helm. Abs., **25**, No. 215e.] Under the conditions of the Tuva region, *Lyperosia titillans* containing infective larvae first appeared from mid-June. The larval incidence ranged from 2 to 7% with a maximum of 12 larvae per fly. The fly showed a preference for male animals and very seldom settled on young animals. It was found that the definitive host is infected through the mouth and that it takes about 11 months for the parasite to mature. The egg-laying period is from spring to late autumn. Attempts to infect one adult and four young cockerels and one hedgehog produced parasitic nodules on the serous membrane of the small intestine of the adult cockerel; none of the other birds or the hedgehog showed any signs of infection. N.J.

(203bb) *Musca amica* is the intermediate host of *Thelazia gulosa* and *T. skrjabini* in the Tuva region. When phenothiazine is given *per os* to cattle at a dose of 30 mg. per kg. body-weight the fly larvae, which develop in the faeces, are killed. N.J.

(203bc) Larvae resembling those of *Gongylonema problematicum* were found in 35·6% of 236 *Blaps halophila* from Uralsk. 20 to 30 of these larvae were fed to four white mice. Three mice died 13, 25 and 30 days after infection respectively. The two mice that died after 25 and 30 days were autopsied and five *G. problematicum* were found in each. The parasites from the second mouse were mature. It is concluded that the development of *G. problematicum* in white mice takes approximately one month. There are three diagrams. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

bd. KARMANOVA, E. M., 1959.—[The biology of *Hystrichis tricolor* Dujardin, 1845 and an account of the epizootiology of *Hystrichis* infection in ducks.] **9**, 113–125. [In Russian.]
be. KARPOVICH, V. N., 1959.—[The helminth fauna of *Desmana moschata*.] **9**, 126–127. [In Russian.]
bf. KASIMOVA, G. A., 1959.—[The more important plant nematodes in Azerbaidzhan and their control.] **9**, 128. [In Russian.]
bg. KOVAL, V. P., 1959.—[A critical survey of species of the genus *Plagioporus* Stafford, 1904 (Trematoda: Digenea).] **9**, 129. [In Russian.]
bh. KONONOVA, M. E. & VINNICHUK, R. I., 1959.—[The disinfection of rice seed from *Aphelenchoides oryzae* Yokoo.] **9**, 130–132. [In Russian.]
bi. KONTRIMAVICHUS, V. L., 1959.—[The helminth fauna of hares in the U.S.S.R. and its zoogeographical analysis.] **9**, 133–144. [In Russian.]

(203bd) Investigations in the Georgian S.S.R. showed that intermediate hosts of *Hystrichis tricolor* were *Criodrilus lacuum* and *Allolobophora dubiosa*; there is no second intermediate host. *C. lacuum* were experimentally infected with a culture of eggs 58 to 62 days old (containing larvae); the larvae hatch in the worm's intestine, enter its body-cavity and pass into the ventral blood vessel, where fourth-stage larvae were found in naturally infected *C. lacuum* and *A. dubiosa*. With more intensive infections larvae were also found in the dorsal blood-vessel. In ducks sexual maturity was attained in 28 to 30 days. The egg-laying period lasts for 40 to 42 days, after which the parasites soon die. Development takes 270 to 300 days. The author outlines the local epizootiology and illustrates the paper with 11 figures. N.J.

(203be) During examination of 82 *Desmana moschata* from the Oka and Khoper State Preserves, Karpovich found *Skrjabinomerus desmanae* and *Cyathocotyle desmanae*. As well as those parasites which had been reported from this host by earlier authors and those previously reported by the present author [for abstract see Helm. Abs., **22**, No. 996bs] *Dilepis undula* and strigeate metacercariae were found. N.J.

(203bf) A mixture of tertiary and secondary butyl chlorides, applied at a dose of 1·5 kg. per sq.m., destroyed the root-knot nematode. This nematode was also successfully controlled by sowing a variety of peas or cereals for one to three years in succession. The following nematodes were found to parasitize cultivated plants in Azerbaidzhan: *Ditylenchus destructor*, *Anguina tritici*, *Tylenchulus semi-penetrans* and *Aphelenchoides oryzae*. N.J.

(203bg) In this short note Koval discusses the synonymy of several species of *Plagioporus*. G.I.P.

(203bh) Various methods of disinfection of rice seed from *Aphelenchoides oryzae* were tested. Hot-water treatment according to Cralley [for abstract see Helm. Abs., **21**, No. 341a] destroyed 53·2% of the nematodes without affecting ability of the seed to germinate. 98·8% of the nematodes were killed when this method was modified, i.e. when the seed was put in water at 55°C. for ten minutes, cooled in water at 18° to 20°C. for ten minutes, heated again in water at 50° to 52°C. and then cooled again; this did not affect germination. Of the chemical methods investigated, fumigation with methyl bromide gave the best results. 98·8% of *A. oryzae* were destroyed by 12 hours' exposure to 20·2 gm. of methyl bromide per cu.m. of fumigation chamber with the humidity of the seed over 14%. 100% efficacy was reached with 72 hours' exposure to 100 gm. of methyl bromide per cu.m. at 18° to 20°C. but the germination was reduced by 11·8% as compared with the control seed. No germination occurred when fumigation was at 27° to 28°C. and it was also more affected when fumigation took place in a vacuum. N.J.

(203bi) Three trematode, 11 cestode and 25 nematode species have been recorded from *Lepus timidus*, *L. europaeus*, *L. tibetanus* and *L. mantschuricus* in the U.S.S.R. *Plagiorchis vespertilionis*, found in ten *L. timidus* in the Yakut A.S.S.R. during 1953–56, is recorded for the first time from hares. All the helminths and their distribution according to zoogeographical zones are listed. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

bj. KUPRIYANOVA-SHAKHMATOVA, R. A., 1959.—[The occurrence of progenetic metacercariae in molluscs in the middle section of the Volga.] **9**, 145–150. [In Russian.]

bk. LEVASHOV, M. M., 1959.—[The principles of studying the geography of helminths.] **9**, 151–154. [In Russian.]

bl. LYUBIMOV, M. P., 1959.—[Seasonal dynamics of *Elaphostrongylus* and *Setaria* infections in *Cervus* spp.] **9**, 155–156. [In Russian.]

bm. MAKARENKO, V. K., 1959.—[*Aprocta skrjabini* n.sp. from the eyes of birds.] **9**, 157–159. [In Russian.]

bn. MAMAEV, Y. L., 1959.—[The helminth fauna of Galliformes and Charadriiformes in eastern Siberia.] **9**, 160–174. [In Russian.]

(203bj) Four species of progenetic metacercariae are described from the middle Volga area: (i) *Asymphylodora progenetica* from *Bithynia tentaculata*; (ii) *Paralepoderma progeneticum* from *Planorbis planorbis*; the metacercariae were fed to a chick but the resulting adults could not be identified although they apparently belong in the Brachylaemidae; (iii) metacercariae from *Viviparus viviparus* were identified as *Echinoparyphium petrowi* on the basis of adults which developed after five and seven days in two experimentally infected chicks (infection of one gosling was unsuccessful); *V. viviparus* is both the first and second intermediate host for this species; this is the first record of progenetic development in Echinostomatidae; (iv) *Paralepoderma brumpti* from tadpoles of *Rana temporaria*; in the area examined the tadpoles are the second and *Lymnaea stagnalis* the first intermediate hosts. *P. brumpti* and *P. progeneticum* are new records for the U.S.S.R. G.I.P.

(203bl) On the basis of five years' observations it is concluded that: (i) the incidence of *Elaphostrongylus* in *Cervus nippon* is highest in January (91·3%) and lowest in October (53·3%), while in *C. canadensis asiaticus* it drops more rapidly from 90% in January to 5 to 10% in August to September; (ii) the incidence in the brain and spinal cord is higher during December and February than during August and October and is also higher in *C. canadensis asiaticus* than in *C. nippon*; (iii) in these localizations *Elaphostrongylus* die throughout the summer (up to September and October) but mass mortality is not observed in the connective tissue, where no seasonal variations in the dynamics are observed; (iv) setariasis is more frequent in the brain than in the spinal cord of *C. nippon* but the reverse is true in *C. canadensis asiaticus*; (v) the seasonal dynamics of *Setaria* in the abdominal cavity varied less than those of the brain and spinal cord, although in both the parasites were dying off; (vi) connective tissue is considered to be the normal site for *Elaphostrongylus* and the abdominal cavity for *Setaria*, while the brain and the spinal cord are considered to be abnormal localizations for both parasites. N.J.

(203bm) *Aprocta skrjabini* n.sp. from the eye of *Phoenicurus phoenicurus phoenicurus* in the Perm area of the U.S.S.R. is described and figured, and compared in a table with *A. microanalis*, *A. noctuae* and *A. semenovi*. It is characterized chiefly by the following features: the length of the oesophagus is about a twentieth of the body length of 13·31 to 14·05 mm. in the male and a thirtieth of the body length of 29 mm. in the female; the vulva lies 0·43 mm. from the anterior end and the two equal spicules are 0·235 to 0·250 mm. long and sword-shaped. G.I.P.

(203bn) Mamaev lists 43 trematode, 47 cestode, 35 nematode and four acanthocephalan species found in 297 Galliformes belonging to nine species and 735 Charadriiformes belonging to 32 species examined in eastern Siberia. Four trematode, one cestode and one nematode species were recorded as new [for abstract see No. 203bo below]. The incidence of helminths ranged from 33·3 to 87·3% among Galliformes and it was 86·5% among Charadriiformes. Young Galliformes had a richer helminth fauna than adults but in Charadriiformes this tended to be reversed. The author subdivides the helminths of Charadriiformes into ubiquitous, southern and northern forms and compares the helminth fauna of these hosts from eastern Siberia with that from other parts of the U.S.S.R. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

bo. MAMAEV, Y. L., 1959.—[New species of helminths from birds of eastern Siberia.] **9**, 175–187. [In Russian.]
bp. MAMONOVA, Z. M., 1959.—[*Heterodera avenae* Filipev, 1934 in Bashkir A.S.S.R.] **9**, 188–189. [In Russian.]
bq. MOZGOVOI, A. A., 1959.—[Unusual localization of Ascaridata and a possible explanation.] **9**, 190–195. [In Russian.]

(203bo) Six new species are described and figured from birds from the area around Yakutsk and Baykal: (i) *Pseudapatemon tiaratus* n.sp., from *Capella stenura*, is intermediate between *P. elassocotylus* and *P. mamilliformis* (measurements of these three species are compared in a table) and differs from the fourth species in the genus, *P. aldousi*, in lacking a well developed copulatory bursa. From the first two it differs by the better developed Brandes' organ and a well marked "neck", furthermore from *P. mamilliformis* by the smaller suckers and from *P. elassocotylus* also by the smaller testes and ejaculatory bursa, and a considerably narrower but equally long body; (ii) *Philophthalmus* (*Philophthalmus*) *offlexorius* n.sp., from *Tringa incana*, is differentiated from *P. lucipetus*, *P. lacrymosus* and *P. skrjabini* by the body (which is 2·47 to 3·50 mm. long, cylindrical, with a maximum diameter of 0·43 to 0·77 mm., and bent at the level of the ventral sucker to almost a rectangle), by the size of the suckers (ventral 0·31 to 0·43 mm. in diameter and the subterminal oral 0·21 to 0·33 mm.), the round and comparatively large testes and the genital bursa which is 0·52 to 0·68 mm. long; (iii) *Cloacitrema deltoida* n.sp., from *T. incana*, differs from the other species in the genus, *C. ovatum*, chiefly by the larger eggs (0·073 to 0·090 mm. × 0·036 to 0·040 mm.); (iv) *Plagiorchis* (*Multiglandularis*) *ovoidalis* n.sp., from *Capella gallinago* and *C. stenura*, is differentiated from the nearest species, *P. oviformis*, by the well developed vitellaria, which clearly join in front of the ventral sucker, and by the larger eggs which are 0·036 to 0·039 mm. × 0·022 to 0·026 mm. (other measurements are compared in a table), and also from *P. multiglandularis*, *P. melanderi*, *P. micronotabilis* and *P. notabilis* by the larger testes, one lying half a testis length behind the other and touching the body wall; (v) *Anomotaenia ancora* n.sp., from *C. stenura*, differs from *A. zederi* by the distribution of the genitalia in the segment and from *A. meinertzhageni* by having 20 hooks and 30 to 36 testes; these are the only two species in *Anomotaenia* with a similar deep mode of fixation to the host intestine; (vi) *Tetrameres* (*T.*) *uxorius* n.sp., from *T. hypoleucos*, is characterized by the relative length of the two spicules (1 : 24 to 1 : 26); they measure 0·086 to 0·088 mm. and 2·10 to 2·24 mm. G.I.P.

(203bp) *Heterodera avenae* damaged crops of summer wheat, barley, oats and maize in the Bashkir A.S.S.R. during 1953–55. Occasional cases of this infection occurred in millet and flax, and three other cultivated and one weed plant [only the Russian popular names are given]. On summer wheat, larvae appeared on the 10th of May and cysts on the 10th of June. On maize, the first larvae were observed on the 28th of June and cysts on the 12th of July. N.J.

(203bq) Mozgovoi describes two personal observations of unusual localizations of Ascaridata. In five white mice experimentally fed with eggs of *Ascaris tarbagan*, the worms were localized only in the liver where they grew and developed. In some *Natrix natrix* and *Coluber ravergieri*, among which there was great mortality in the Moscow Zoological Gardens, *Amplicaecum schikhobalovi* was found not only in the gastro-intestinal tract but also in the liver where they were only slightly smaller. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

br. MOROZOV, Y. F., 1959.—[Two new species of nematodes from rodents.] **9**, 196–202. [In Russian.]
bs. NAZAROVA, N. S., 1959.—[A new intermediate host of *Moniliformis moniliformis* (Bremser, 1811).] **9**, 203–205. [In Russian.]
bt. NIKULINA, N. K., 1959.—[The distribution of nematodes on vegetables and potatoes in the R.S.F.S.R.] **9**, 206–207. [In Russian.]
bu. OZERSKAYA, V. N., 1959.—[Ditrazine as an anthelmintic against dictyocauliasis in sheep.] **9**, 208–210. [In Russian.]
bv. PAVLOV, A. V., 1959.—[The life-cycle of *Hepaticola hepatica*.] **9**, 211–215. [In Russian.]
bw. PAVLOV, A. V., 1959.—[Pathological changes in the liver of rodents with *Hepaticola* infections.] **9**, 216–221. [In Russian.]

(203br) *Rictularia sibiricensis* n.sp., from *Clethrionomys rutilus* in the Yakut A.S.S.R., is nearest to *R. baicaliensis* and *R. coloradensis* but is characterized by the shape of the female tail, the number of caudal papillae in the male (two pairs of pre-anal, one pair of ad-anal, four pairs of post-anal and an unpaired post-anal—described from the only male present in the material) and the size of the eggs and of the worms (male 6·318 mm. and female 17·68 to 29·14 mm. long). *Thominx sadovskajae* n.sp., from *Apodemus flavicollis*, *C. glareolus* and *Microtus arvalis* in Byelorussia, is characterized by long caudal alae; the spicule is 0·897 to 1·086 mm. long; the spicule pouch is gophered distally and, more proximally, is covered by small conical tubercles which at the proximal end become oblong, irregularly shaped plates; and the male tail has a bursa-like structure formed by the tail membrane which is supported by three pairs of ray-like appendages each terminating in a papilla. G.I.P.

(203bs) The larvae of *Moniliformis moniliformis* were found in the body-cavity of seven out of 500 *Scarabaeus sacer* examined in the Crimea, which represents a new intermediate host. Experimental infection of three white mice and one puppy produced seven adult parasites in the puppy and two in one mouse after 110 days. The paper is illustrated with two figures. N.J.

(203bt) Nikulina gives a brief account of the distribution and damage caused by *Meloidogyne*, *Ditylenchus allii*, *D. destructor* and *Heterodera rostochiensis* in the R.S.F.S.R. where *H. schachtii* and *Pratylenchus pratensis* have also been recorded. N.J.

(203bu) Ditrazine citrate cured all of 18 sheep with dictyocauliasis when injected subcutaneously on two successive days at a dose of 0·1 gm. to 0·2 gm. per kg. body-weight, dissolved in distilled water in the proportion of 1 : 3 to 1 : 4. Ditrazine phosphate given in the same way, cured one of four sheep at a dose of 0·05 gm. per kg. and 75% [*sic*] of 14 sheep at a dose of 0·1 gm. per kg. Tracheotomy of two sheep infected with *Dictyocaulus* and *Protostrongylus* showed that ditrazine caused disintegration of the parasites. The efficacy of ditrazine citrate in the treatment of sheep for dictyocauliasis under field conditions ranged from 88·3% to 98·2% and for muelleriasis from 36·3% to 98·4%. The efficacy of ditrazine phosphate was almost the same. N.J.

(203bv) Livers of Muridae containing eggs of *Hepaticola hepatica* were fed to a marten and to a hen. At 25°C. they became infective within 42 to 45 days after they had been passed in the faeces. The effect of decomposition of the liver on the development of the eggs was also studied. White mice were infected with a three-month-old egg culture; females became mature on the 21st day and died and began to disintegrate on the 26th to 28th day; males died on the 18th to 20th day. The eggs were surrounded by a solid layer of connective tissue and did not develop in the liver. It is concluded that the infection is maintained mainly through small Muridae, which are eaten by predatory mammals and birds which spread the infection. Some part is also played by beetles eating decomposing carcasses of infected Muridae. N.J.

(203bw) Pavlov describes pathological changes due to *Hepaticola hepatica* infection in beavers, voles and white mice. The pathological changes were observed for five months. The presence of haemorrhages around the parasites indicated that these move in the liver. The paper is illustrated with nine photomicrographs. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

bx. PANASYUK, D. I. & POLYAKOVA, O. I., 1959.—[Diagnosis of the early stages of dictyocauliasis in sheep by allergic reactions.] **9**, 222–224. [In Russian.]

by. PODYAPOLSKAYA, V. P., 1959.—[The epidemiology of the more important helminth infections (ascariasis and trichuriasis) and their control in the U.S.S.R.] **9**, 225–229. [In Russian.]

bz. PROSHIN, I. G., 1959.—[Method of determining the viability of ascarid larvae.] **9**, 230–231. [In Russian.]

ca. RIBALTOVSKI, O. V., 1959.—[The pharmacodynamics of pumpkin seed.] **9**, 232–233. [In Russian.]

cb. RIZHIKOV, K. M., 1959.—[The helminth fauna of *Cygnus bewickii*.] **9**, 234–242. [In Russian.]

(203bx) Four antigens, (i) polysaccharide fraction prepared by Melcher's method, (ii) complete antigen according to Boivin, (iii) complete antigen according to Kuzin & Polyakova, and (iv) an extract of dried and defatted *Dictyocaulus*, were tested on a total of 944 naturally and ten experimentally infected sheep and on 18 calves. Sheep with other helminthic infections and uninfected lambs served as controls. The specificity of the antigens prepared from *D. filaria* was also tested on 20 guinea-pigs. Good results were obtained with the first three antigens used in intradermal tests on sheep in the proportion of 1 : 5,000 to 1 : 10,000 in saline. The reaction appeared after one to two hours and lasted for eight to 12 hours. It was positive in lambs five days after infection with *D. filaria*. The erythrocyte sedimentation test gave misleading results. Antigens (i) and (ii) gave negative results in intradermal tests on infected calves as well as in tests on the conjunctiva and with precipitation and microprecipitation reactions. N.J.

(203by) In her discussion of the epidemiology of ascariasis and trichuriasis, Podyapolskaya draws attention to the ability of *Ascaris* larvae to hatch in an external environment and to the possibility of natural percutaneous infection. N.J.

(203bz) All living larvae of the dog ascarid rolled up into a spiral "door spring" when their two ends were touched with electrodes transmitting an intermittent induced current. Details of the apparatus etc. are given; the time of exposure was 1 to 6 sec. This "door spring" effect was also obtained in 94% live larvae in a saturated solution of sodium bicarbonate, in 100% of larvae in 27% solution of sodium chloride, and also in 30% to 40% ethyl alcohol. Dead larvae (killed by heat, or those that died in physiological solution) did not acquire the "door spring" effect when subjected to any of the above procedures. N.J.

(203ca) Experiments showed that: (i) defatted pumpkin seed flour caused pathological changes in the digestive tract of white rats except when mixed with wheat bran; (ii) defatted pumpkin seed decoction and flour introduced directly into the stomach of dogs increased the secretion of juices; (iii) decoction and infusion of the seed intensified and increased the frequency of contractions in isolated sections of rabbit small intestine; (iv) large doses of decoction affected the motility of *Ascaris suum* and *Drepanidotaenia lanceolata* but did not kill them. N.J.

(203cb) The following helminths are reported from six *Cygnus bewickii* in the Yakutsk area, for the first time from this host in the U.S.S.R.: *Notocotylus parviovatus*, *Echinostoma dietzi*, *Pseudobilharziella filiformis*, *Prosthogonimus cuneatus* (described and figured), *Eucotyle* sp. (damaged specimen), *Anomotaenia ciliata*, *Amidostomum cygni* (described and figured), *Tetrameres zakharowi* (described) and *Sarconema eurycerca*. *T. zakharowi* is a new record for this host and *A. cygni* is new for the U.S.S.R. A short analysis of the helminth fauna of *Cygnus* includes a list of the parasites of *C. cygnus*, *C. olor* and *C. bewickii*, the three species encountered in the U.S.S.R. G.I.P.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

cc. RIZHIKOV, K. M. & GUBANOV, N. M., 1959.—[The cestode fauna of Anseriformes in Verkhoyansk (Yakut A.S.S.R.).] **9**, 243–248. [In Russian.]

cd. RIZHIKOV, K. M. & NAZAROVA, N. S., 1959.—[Reservoir parasitism in *Physocephalus sexalatus* and *Spirocerca lupi*.] **9**, 249–252. [In Russian.]

ce. RIKOVSKI, A. S., 1959.—[A study of the helminth fauna of elk and factors in its formation.] **9**, 253–263. [In Russian.]

cf. SAPELINA-BELOKURSKAYA, V. I., 1959.—[Control measures against *Heterodera rostochiensis* in Lithuanian S.S.R.] **9**, 264–265. [In Russian.]

(203cc) Seventeen species of cestodes are listed from Anseriformes in the Yakut A.S.S.R. They include *Wardium nyrocae* n.sp., from *Clangula hyemalis*, and *W. aequabilis*; both are described and figured. The important factors of the new species are the rostellar hooks, which measure 0·015 to 0·017 mm. in length and have a comparatively long handle, the lobed testes and the asymmetrical somewhat aporal, position of the ovary and vitelline gland. G.I.P.

(203cd) The larvae of *Physocephalus sexalatus* and of *Spirocerca lupi* were the most frequent among the larval spirurids from five amphibian, 44 bird and 13 mammal specimens from various regions of the U.S.S.R. *P. sexalatus* were found in 23 hosts (14 species of birds and two mammals, *Erinaceus europaeus* and *Eptesicus turcomani*). *S. lupi* came from 25 hosts (belonging to 13 bird species and one mammal, *Putorius eversmani*). Both larvae were encapsulated in various organs; those of *P. sexalatus* were mainly in the muscular layer of the gut wall and those of *S. lupi* in the parenchymatous organs and on the serous membranes. Both are described and illustrated. N.J.

(203ce) From the literature and 26 autopsies carried out over six years in the Kaluga region, Rikovski concludes that the elk helminth fauna in the Palearctic consists of four trematode, five cestode and 29 nematode species [28 of which are listed]. In giving their geographical distribution the terms "transarealic" and "partarealic" are used to indicate respectively whether a given helminth species is encountered throughout the entire region populated by a given host, or not. Ecologically helminths are subdivided into groups according to the types of natural biotopes of their infective larvae. The biotopes are: (i) soil, (ii) pasture plants, (iii) water or aquatic plants, (iv) insects, (v) another animal, usually the prey of the host. In this light the author discusses the helminth fauna of elk. The author found that by feeding two elks on *Menyanthes trifoliata* and one on *Cella palustris* for 24 days, the number of eggs of *Trichuris ovis* in the faeces was reduced to 40% to 50% of the previous count. A large number of the helminths are acquired by the elk from domestic animals [for abstract of paper by Rikovski, 1955, see Helm. Abs., **24**, No. 555a]. Rikovski states that the only species specific to this host are *Parafasciolopsis fasciolaemorpha*, *Ostertagia antipini*, *Spiculopteragia alcis*, *Varestrongylus alces*, *Nematodirella longissimespiculata* and *N. alcidis*. N.J.

(203cf) Chloropicrin at doses of 50 to 250 c.c. per sq. m. combined with mulching for ten to 40 days, reduced the incidence of *Heterodera rostochiensis* by 80 to 100%. A 100% efficacy was obtained with 1 kg. to 3 kg. of dichlorethane or its residues per sq. m. applied in spring with subsequent mulching. In both instances the efficacy was a little less at autumn application. 150 gm. of the Preparation No. 23 [ethyl ether of dimethyldithiocarbamic acid] per sq. m. reduced the incidence of *H. rostochiensis* by 84% after one application and by 100% after two applications. In all cases potato crops were greatly increased. Black fallowing reduced the number of cysts in the soil by 50 to 64%. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

cg. SEMENOV, V. L., 1959.—[On the variation in the number of helminth larvae migrating in the host.] **9**, 266–267. [In Russian.]
ch. SKARBILOVICH, T. S., 1959.—[The classification of nematodes of the family Anguillulinidae Baylis & Daubney, 1926.] **9**, 268–271. [In Russian.]
ci. SKRYABIN, K. I., 1959.—[Unity of theory and practice—a realistic basis for the eradication of pathogenic helminths in the U.S.S.R.] **9**, 272–277. [In Russian.]
cj. SKRYABIN, K. I., 1959.—[The position of the trematode, *Accacladocoelium alveolatum* Robinson, 1934, within the Hemiurata.] **9**, 278–279. [In Russian.]
ck. SKRYABIN, K. I. & GUSHANSKAYA, L. K., 1959.—[Ontogenesis and the individual stages of development in representatives of the suborder Hemiurata.] **9**, 280–293. [In Russian.]

(203cg) Thirty-five white rats were infected with ascarid and 57 with *Trichinella* larvae. More ascarid larvae reached the liver and lungs in rats in which the central nervous system was inhibited (by induced sleep) than in controls. No ascarid larvae were found in the liver or lungs of the controls 30 days after a repeated infection but they were found in these organs in rats under induced sleep. The number of trichinae was greater in the muscles of rats under induced sleep. More trichinae were also found in the muscles of animals subjected to irritation by sound for many days. The number of trichinae was also greater in the winter than in the spring and summer. It is concluded that disturbance of the balance between stimulating and inhibiting processes in the central nervous system lowers the resistance to ascarid and *Trichinella* infection. G.I.P.

(203ch) Skarbilovich proposes to split the Tylenchida into the Heteroderata n.subordo for forms with well developed dimorphism, the females of which lay eggs with formed larvae into an egg sac, and the Tylenchata for forms without dimorphism or an egg sac. Heteroderata contains Heteroderidae, which is subdivided into (i) Heteroderinae for *Heterodera*, (ii) Tylenchulinae for *Tylenchulus* and *Rotylenchulus* and (iii) Meloidogininae n.subf. for *Meloidogyne* and *Meloidodera*; (iv) the Nacobbinae with *Nacobbus* and (v) Sphaeronematinae with *Sphaeronema* are also included in the Heteroderidae. In the Tylenchata the following nine familes are placed: (i) Tylenchidae with the subfamilies Tylenchinae (containing *Tylenchus*, *Ditylenchus*, *Anguina*, *Psilenchus*, *Tetylenchus*, *Tylenchorhynchus* and *Chitinotylenchus*), Pratylenchinae (containing *Pratylenchus* and *Radopholus*) and Hoplolaiminae (containing *Hoplolaimus*, *Rotylenchus* and *Helicotylenchus*); (ii) Neotylenchidae containing Neotylenchinae (*Neotylenchus*, *Hexatylus* and *Deladenus*), Nothotylenchinae (*Nothotylenchus*, *Thada*, *Baleodorus* and *Halenchus*) and Paurodontinae (*Paurodontus* and *Stictylus*); (iii) Criconematidae containing Criconematinae (*Criconema* and *Criconemoides*), Hemicycliophorinae n.subf. (*Hemicycliophora*) and Paratylenchinae (*Paratylenchus* and *Cacopaurus*); (iv) Dolichodoridae n.fam. for Dolichodorinae (*Dolichodorus* and *Belonolaimus*); (v) Macroposthoniidae n.fam. containing Macroposthoniinae n.subf. (*Macroposthonia*); (vi) Nemonchidae n.fam. containing Nemonchinae n.subf. (*Nemonchus*); (vii) Atylenchidae n.fam. for Atylenchinae n.subf. (*Atylenchus* and *Eutylenchus*); (viii) Ecphyadophoridae n.fam. containing Ecphyadophorinae n.subf. (*Ecphyadophora*); and Iotonchidae n.fam. for Iotonchinae (*Iotonchium*). [See also Helm. Abs., **28**, No. 1d.] G.I.P.

(203cj) *Guschanskiana* n.g. is erected for *Accacladocoelium alveolatum*, principally on the characteristic structure of the vitellaria but also the hermaphrodite bursa and the structure of the cuticular cover of the posterior body. The new genus is placed in Guschanskianinae n.subf., which remains in Accacoeliidae until further revision of the family. G.I.P.

(203ck) The authors have considered the development of various members of the Hemiurata and conclude that the typical hemiurid life-cycle goes through the stages described for *Halipegus eccentricus*. G.I.P.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

cl. SMIRNOV, P. V., 1959.—[Data on the distribution and treatment of fascioliasis in pigs in northern districts of the Sverdlovsk region.] **9**, 294–295. [In Russian.]

cm. SPASSKI, A. A., 1959.—[The polyphyletic origin of the genus *Oligorchis* Fuhrmann.] **9**, 296–310. [In Russian.]

cn. SPASSKI, A. A., IVASHKIN, V. M. & BOGOYAVLENSKI, Y. K., 1959.—[The work of the 306th All-Union helminthological expedition in 1956 to the Tuva Autonomous Region. (Preliminary communication).] **9**, 311–313. [In Russian.]

co. SPASSKI, A. A. & SPASSKAYA, L. P., 1959.—[The structure of the genital apparatus of the cestode, *Arostellina reticulata* Neiland, 1955.] **9**, 314–318. [In Russian.]

cp. SOPRUNOV, F. F. & TENDETNIK, Y. Y., 1959.—[The use of predacious fungi for the control of some geohelminths.] **9**, 319–321. [In Russian.]

cq. SUDAKOVA, I. M., 1959.—[Weeds as reservoir hosts of plant nematodes.] **9**, 322–325. [In Russian.]

(203cl) The degree of *Fasciola* infection was found to be in direct relation to the age of pigs. Hexachlorethane was given in various doses with flour to 43 pigs after 12 to 14 hours' starvation. The optimum dose was 0·2 gm. per kg. body-weight. Usually no eggs were observed in the faeces after the 5th or 6th day, and the condition of the treated animals improved. The toxic dose is stated as 1 gm. per kg. body-weight. N.J.

(203cm) Spasski has shown that *Oligorchis* is a collective polyphyletic group and proposes the following placing of the 12 species included at one time or other in this genus: five should rightly remain in *Paradilepis* (i.e. *delachauxi*, *burmanensis*, *longivaginosus*, *urceus* and *yorkei*) and one in *Hymenolepis* (*nonarmatus*); *O. cyanocittii* is transferred to *Passerilepis* as *P. cyanocittii* n.comb.; *O. kwangensis* is transferred as a new combination to *Hybridolepis* n.g. which is erected for *Hymenolepis hughesi*; *O. magnireceptaculata* is returned to *Pseudoligorchis*; *O. paucitesticulatus* is provisionally transferred to *Limnolepis*; and *O. toxometra* (insufficiently described) is removed from *Oligorchis*, its generic position remaining open. *O. strangulatus*, the type and only species remaining in the genus, was insufficiently described and has not been again reported in the last 50 years; its specific validity is therefore uncertain and consequently the validity of *Oligorchis* itself is questionable. Spasski discusses the relatively high number of testes in species of *Oligorchis* showing this to be a secondary character. G.I.P.

(203cn) Spasski *et al.* give a preliminary report on the helminthological expedition to the Tuva region in 1956. Biological and veterinary sections examined a total of over 1,650 fishes, amphibians, reptiles, birds and mammals, including domestic animals. Experiments were also carried out on prophylaxis; dogs were experimentally infected with *Coenurus* from cattle which resulted in some *Multiceps multiceps* with one crown of hooks as well as the typical forms. N.J.

(203co) A study of Neiland's illustrations and description of *Arostellina reticulata* has led Spasski & Spasskaya to conclude that Neiland's vitelline gland and ovary are the Mehlis' gland and vitelline gland respectively. The anterior reticulate body is thought to be either the ovary (if the proglottis figured by Neiland was a young one) or the uterus, the ovary having already disintegrated. Thus the distribution of the female glands is typical of Dilepidinae; an emended diagnosis of *Arostellina* is given. G.I.P.

(203cp) Of 20 strains of predacious fungi, *Arthrobotrys oligospora* and *A. dolioformis* showed the most promising possibilities in the control of nematodes. Oat and maize grits were found to be the most suitable substrates for their cultivation. By using these fungi in a coalmine five times during three years, the number of cases of ancylostomiasis was reduced from 171 to 34 and the number of new infections from 63 to three in six months. Positive results were obtained in the control of the root-knot nematode. N.J.

(203cq) Having compared the nematode fauna of weeds found with onions and garlic Sudakova concludes that: (i) weeds are primary reservoirs of eelworms and their nematode fauna always consists of a considerable number of para-rhizobionts and plant parasites of non-specific pathogenic effect; (ii) weeds are reservoirs of stylet-bearing nematodes; (iii) when numerous, weeds are of importance in the accumulation and spread of infection. N.J.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

cr. SUDARIKOV, V. E., 1959.—[Biological peculiarities of the trematode genus *Alaria*.] **9**, 326–332. [In Russian.]

cs. SULTANOV, M. A., 1959.—[The helminth fauna of domestic and wild birds in Uzbekistan.] **9**, 333–335. [In Russian.]

ct. SULTANOV, M. A. & SPASSKAYA, L. P., 1959.—[The cestode fauna of passerine and coraciiform birds of Uzbekistan.] **9**, 336–339. [In Russian.]

cu. TAREEVA, A. I., 1959.—[Search for new anthelmintics.] **9**, 340–342. [In Russian.]

cv. TULAGANOV, A. T., 1959.—[Some results of investigations in the field of phytonematology in Uzbekistan during 1951–1955.] **9**, 343–345. [In Russian.]

cw. CHOIZHO, U., 1959.—[New helminths from horses.] **9**, 346–361. [In Russian.]

(203cr) Sudarikov sums up the present knowledge of the biology of *Alaria* under the headings: brief historical review, the life-cycle and naming of the developmental stages, nomenclature of hosts, and the characteristic features of its biology. G.I.P.

(203cs) Autopsies of 925 domestic fowls, turkeys, ducks and geese and of 530 wild birds, belonging to 42 species and nine orders, were carried out in Uzbekistan. 76·9% of the domestic birds and 61·7% of the wild birds were infected with a total of 171 species of trematodes, cestodes, nematodes and acanthocephalans. The following helminths are recorded for the first time in the U.S.S.R.: *Paramonostomum bucephalae*, *Postharmostomum fleuryi*, *Wardium himantopodis*, *Epomidiostomum crami*, *E. querquedulae* and *Pseudamidostomum boulengeri*. Chickens up to six weeks old were free from infection. The highest incidence was among three-month-old chickens and a similar incidence was observed among adult fowls. N.J.

(203ct) 21·4% of 259 passerine and 45 coraciform birds examined in Uzbekistan were infected with cestodes. The scoleces of one of the 12 species present were identical with those described by Spasski and included in *Biuterina rectangula* (which was later transferred and renamed by Matevosyan as *Paruterina garrula*), while the proglottides were identical with Fuhrmann's original description of *B. rectangula* from segments only. Consequently this species is now transferred to *Paruterina* as *P. rectangula* n.comb. and *P. garrula* falls as its synonym. G.I.P.

(203cu) Cats naturally infected with ascarids, *Hydatigera* and *Dipylidium* were used to test new anthelmintics. 1-2 ethyltetralin and 1-4 ethyltetralin were the most effective of 16 derivatives of tetrahydronaphthalene. The efficacy of 1-4 ethyltetralin was 93·3%. Ditrazine citrate and ditrazine phosphate were equally effective against ascarids in cats and man but the latter was not effective against human trichuriasis. Imizin citrate and imizin phosphate were effective against ascarid infection in cats but not in man. Piperazine hexahydrate and piperazine adipate had a significant effect against ascarids in cats but not against *D. caninum* or *H. taeniaeformis*. Aminoacrichin had a 100% efficacy against *Hydatigera* and 92% against *Dipylidium* in cats, but it was ineffective against *Toxocara mystax*. Its four analogues were also ineffective and caused vomiting. N.J.

(203cw) Three nematodes are described and figured from horses and mules in the Mongolian People's Republic. The first two are placed in new genera in the Trichonematinae, tribe Trichonematea. *Bidentostomum ivaschkini* is characterized chiefly by the presence in the cylindrical buccal capsule of a long, wide dorsal groove and two long, thin teeth. In *Tridentoinfundibulum gobi* the cylindrical buccal capsule is wide and shallow and its walls are thicker at the base, the female tail is straight and pointed and, in the male, the dorsal ray is branched to its base and the externo-dorsal ray arises independently. *Cylicodontophorus mongolica* differs from the nearest, *C. ornatum*, by the structure of the thick-walled buccal capsule, which is constricted at the top and lacks a dorsal groove, by the gubernaculum, which is supported by a characteristically shaped muscular body, lacks a proximal handle while its distal end is expanded into two triangles, by the long prebursal papillae and the sharply pointed female tail. The eight genera in Trichonematea are differentiated in a key. [These three nematodes were originally described in 1957 in Choizho's thesis "Parasitic worms of horses of the Mongolian People's Republic" and their description appears also in T. I. Popova's "Principles of nematology, edited by K. I. Skryabin, vol. VII, 1958, Strongyloidea of animals and man, Trichonematidae".] G.I.P.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

cx. KHOKHOLKOVA, N. A., 1959.—[Attempt to eradicate a focus of ancylostomiasis in mines in Lenger city.] **9**, 362–363. [In Russian.]
cy. CHANISHVILI, I. V., 1959.—[Principal factors in the epidemiology of geohelminths in the town of Tbilisi.] **9**, 364–367. [In Russian.]
cz. CHERNIKOVA, M. S., 1959.—[Stem nematode of strawberries.] **9**, 368–369. [In Russian.]
da. SHARPILO, V. P., 1959.—[The helminth fauna of some reptiles in the Ukrainian S.S.R.] **9**, 370–376. [In Russian.]
db. SHIKHOBALOVA, N. P., 1959.—[Experimental data on immunity in *Heterakis* infections of domestic birds.] **9**, 377–383. [In Russian.]
dc. SHIKHOBALOVA, N. P., 1959.—[Interspecific hybridization in parasitic nematodes.] **9**, 384–388. [In Russian.]

(203cx) Systematic examination of miners, treatment of cases, improved sanitary conditions and control of the larvae with sodium chloride reduced the incidence of *Ancylostoma* and *Necator* in the mines of Lenger from 9·1% in 1949 to 0·1% in 1954. N.J.

(203cy) 80·7% of soil samples from gardens watered from the Kura river contained helminth eggs, 79·2% of which were ascarid and 12·9% trichurid. The intensity of pollution was even greater in those gardens irrigated with sewage waters. The river water which receives the sewage waters of Tbilisi contained 2·9 to 7·2 helminth eggs per litre towards the centre of the town and one egg per litre 20 to 25 km. lower down the river. Ascarid and trichurid eggs survived the winter and resumed development after being placed at a depth of 3 cm. to 5 cm. but all perished in 11·5 to 12·5 months. Eggs died in 90 min. when exposed to sunlight at a soil temperature of 48° to 50°C. but survived longer when embryonated. Hookworm eggs were killed after 45 minutes at a soil temperature of 39° to 42°C. The temperature of 0° to 0·2°C. killed these eggs after 12 hours and infective larvae after 114 hours. Ascariasis and trichuriasis are the most frequent helminthic infections among the population of Tbilisi. N.J.

(203cz) The incidence of *Ditylenchus dipsaci* was 7·5% on newly established strawberry plantations, increasing to 59·7% in the third year. Elimination of infected plants and disinfection of soil with 1 : 50 formalin solution are recommended as prophylactic measures. 80 to 85% of seedlings soaked in water at 10° to 19°C. rooted but after soaking in formalin solution only 40% did so. N.J.

(203da) Thirteen species of trematodes (including three larval forms), three each of cestodes and nematodes, and one acanthocephalan are listed from reptiles in the Ukrainian S.S.R. with data on host species, degree of infection, localities and previous records in the U.S.S.R. Of the 13 host species examined the most heavily infected were *Natrix natrix* (94·2%), *Vipera berus* (82·3%) and *Eremias argutta* (72·2%). *V. berus* appears to be a new host record for *Distomum* (s.l.) *cloacicola*; specimens from this host were larger than those from *Natrix* spp. G.I.P.

(203db) The results of a series of four experiments on immunity to *Heterakis* in chickens aged 20 to 25 days, led Shikhobalova to conclude that a small degree of acquired immunity develops in response to *H. gallinae* infection which, on reinfection, expresses itself in a reduced number of worms showing retarded development and a smaller average size. Superinfections may lead to an intensification of immunity which acts not only on worms from the second infection but also on those from the first. G.I.P.

(203dc) The summarized results of four experiments show that following infection of 26 chickens with equal numbers of both *Syngamus skrjabinomorpha* and *S. trachea* (totalling from 500 to 1,000 eggs per bird aged one to one-and-a-half months), 415 nematode pairs were recovered of which 217 were *S. skrjabinomorpha*, 185 were *S. trachea* and 13 were mixed. In 12 of the mixed pairs the female was *S. skrjabinomorpha* and only in the fourth experiment did these females contain eggs. The eggs developed normally but the experimental infection of seven chickens resulted in one mixed pair, the female of which lacked eggs. G.I.P.

203—Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR. (cont.)

dd. SHMALKO, V. F., 1959.—[The cactus nematode, *Heterodera cacti* Filipev & Schuurmans-Stekhoven, 1941.] **9**, 389–390. [In Russian.]

de. SHULMAN, E. S., 1959.—[Regional epidemiology of helminthiases in the Ukrainian S.S.R. and the eradication of foci.] **9**, 391–394. [In Russian.]

df. SHULTS, R. S., 1959.—[Primary immunity to helminthiases.] **9**, 395–397. [In Russian.]

dg. SHUMAKOVICH, E. E., PETROCHENKO, V. I. & MATEVOSYAN, E. M., 1959.—[The assistance given to collective farms in the Stalingrad region in the control of helminthiases in farm animals.] **9**, 398–400. [In Russian.]

dh. EVRANOVA, V. G., 1959.—[*Ascaris mosgovoyi* n.sp. from reindeer.] **9**, 401–402. [In Russian.]

di. EGLITIS, V. K. & KAKTINYA, D. K., 1959.—[On Heteroderidae in Latvian S.S.R.] **9**, 403–406. [In Russian.]

(203dd) *Heterodera cacti* is recorded for the first time in the U.S.S.R.; it was found on 69 species of Cactaceae and on two species of Euphorbiaceae in the hot-houses of the principal botanical garden of the Academy of Sciences of the U.S.S.R. Experimental treatments with Forbiat and Cystogon failed to give 100% efficacy. N.J.

(203df) Shults briefly discusses the concept of primary immunity preferring, from among the various meanings ascribed to it, Moshkovski's definition of "primary immunological state" which stands opposed to "secondary immunity" (acquired etc.). Shults subdivides primary immunity into specific, age and individual immunity and discusses the influence of the nature of the host-parasite relationship on the intensity of immunity. He suggests the direction for future research in helminthological immunity. G.I.P.

(203dh) *Ascaris mosgovoyi* n.sp. is described and figured from three males recovered from the intestine of reindeer in Russia. It differs from other ascarids chiefly in the shape of the oral lips and spicules. This is the first time an ascaris has been described from reindeer. Although these ascarids were previously noted by Skryabin in 1931, the original material was subsequently lost. G.I.P.

(203di) The 92 hosts of the root-knot nematode in the Latvian S.S.R. are listed; they include a large number of hosts not mentioned in published lists for the U.S.S.R. Other members of the Heteroderidae found in Latvia are *Heterodera rostochiensis*, *H. schachtii*, *H. avenae*, *H. göttingiana* and a species of *Heterodera* on *Galeopsis* spp., probably *H. galeopsidis*, but with cysts larger than reported in the literature and containing up to 536 eggs. On members of the Cruciferae and Polygonaceae, cysts were found which were morphologically indistinguishable from those of *H. schachtii* but which were specific to these hosts and did not affect nearby growing beet crops. Cysts of another species, *H. scleranthii* n.sp., were found on *Scleranthus annuus*; these differ from other forms of the *H. schachtii* group by the large and strong egg sac containing up to 285 eggs with a size proportion of width to length of 1: 2·3 [no other data about the new species are given]. G.I.P.

204—Trudi Gruzinskogo Ordena Trudovogo Krasnogo Znameni Selskokhozyaistvennogo Instituta.

a. KALANDADZE, L. P. ET AL., 1959.—[A study of the potato stem eelworm in the Georgian S.S.R.] **51–52**, 195–213. [In Georgian: Russian summary pp. 210–211.]

(204a) The potato stem eelworm was found to be wide-spread in all the potato growing areas of Georgia (U.S.S.R.). None of the potato varieties in use were particularly resistant. Data are given on the way in which the infection is spread, on the resistance of the eelworms to temperature and drying and on control. G.I.P.

205—Trudi Voronezhskogo Zoovetinstituta.

a. MITSKEVICH, V. Y., 1959.—[*Capillaria* spp. in reindeer (*Rangifer tarandi*).] **16**, 263–275. [In Russian.]

(205a) *Capillaria* is reported for the first time from *Rangifer tarandus*; the infection was encountered on the Kolsk peninsula and the Leningrad Zoological Gardens. Two species were found on autopsy of a young reindeer: specimens of *C. brevipes*, which differ from those originally described by Ransom (the differences between these and *C. bovis* are tabulated), and *C. rangiferi* n.sp. from the small intestine. The new species is nearest to *C. brevipes* and *C. okapi* but differs from these and the other three species parasitic in ruminants, *C. bilobata*, *C. megrelica* and *C. bovis*, by a combination of the following characters: the ratio of the oesophageal to the posterior part of the body is 1: 1·4; the spicule is thin and reaches 1·96 mm. in length; the tubular sheath is shorter than the spicule and its everted portion is thickish and gophered; the lateral alae have an anterior narrow section and a posterior wide section; the male tail carries a membranous bursa-like structure supported by two sturdy, leg-shaped processes at the base of which there is a dorsal and a ventral pair of sessile papillae and on the dorsal side also two tubercles; the lipless vulva lies 0·143 mm. to 0·182 mm. behind the oesophagus and there is a round cuticular outgrowth anterior to it; the smooth, asymmetrical eggs measure 0·048 mm. to 0·052 mm. × 0·023 mm. to 0·026 mm.; and the anus is subterminal. A key to these species of *Capillaria* from ruminants is given. G.I.P.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina.

a. VASILKOV, G. V., 1959.—[Differential diagnosis of the larvae of *Parafilaria*, *Setaria* and *Onchocerca*.] **6**, 3–6. [In Russian: English summary pp. 5–6.]

b. KOTELNIKOV, G. A., 1959.—[The life-cycle of *Filicollis anatis* and the epizootiology of the disease in ducks.] **6**, 7–19. [In Russian: English summary p. 19.]

c. KUZNETSOV, M. I., 1959.—[The intermediate hosts of *Moniezia* in the steppe area of the lower Volga basin.] **6**, 20–23. [In Russian: English summary p. 23.]

(206a) To facilitate identification of the four filariid species parasitic in horses, namely, *Setaria equina*, *Parafilaria multipapillosa*, *Onchocerca cervicalis* and *O. reticulata*, Vasilkov describes the three types of larvae from material cultured in the laboratory and also collected directly from the host. Only *Setaria* larvae were found in venous blood and only *Onchocerca* larvae in the skin; in blood taken from open wounds (caused by the females perforating the skin) numerous eggs and occasional larvae of *Parafilaria* were present but blood samples from the vein and ear and skin snips from the same horses were negative for *Parafilaria*. G.I.P.

(206b) *Filicollis anatis* larvae were found only in *Asellus aquaticus*, of which 2,340 specimens were examined; 973 *Gammarus lacustris* and other crustaceans including *Cyclops* and *Daphnia* were negative. In experiments with *A. aquaticus*, infective larvae were obtained after 25 days at 24° to 26°C. and after 40 days at 17°C. Eggs which were infective were found in the faeces of ducklings 29 to 30 days after exposure; they did not develop further but 98% remained viable for three months at a temperature of 12° to 18°C.; viability was reduced to 1·4% after seven months. Eggs remained viable throughout the winter at a depth of 0·7 m. to 0·8 m. in soil under natural conditions at temperatures of about 4°C. In the Chernigov region the ducks became infected from the beginning of the grazing period until December and lost the infection during the winter. 19 diagrams are given. N.J.

(206c) Experimental infections of 873 and 764 oribatid mites with *Moniezia expansa* and *M. benedeni* respectively gave positive results for both species in the following: *Scutovertex minutus*, *Zygoribatula frisiae*, *Trichoribates incisellus* subsp., *Ceratozetes* sp., *Scheloribates* sp. and *Galumna* sp. It is stated that all these are new host records [but some of these have already been recorded as hosts for *Moniezia*]. *Zygoribatula coguata*, *Zygoribatula* sp. and *Oribatula* sp. did not become infected with either cestode; *Carabodes* sp. was susceptible to *M. benedeni* only. N.J.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina. (cont.)

d. PASKALSKAYA, M. Y., 1959.—[The life-cycle of *Plagiorchis arcuatus* Strom, 1924.] **6**, 24–30. [In Russian: English summary p. 30.]

e. VASILKOV, G. V., 1959.—[Study of the epizootiology of parafilariasis of horses.] **6**, 31–37. [In Russian: English summary p. 37.]

f. KUZNETSOV, M. I., 1959.—[The age dynamics of *Moniezia expansa* and *M. benedeni* infections and some data on *Thysaniezia giardi* infection of sheep in the lower Volga basin.] **6**, 38–49. [In Russian: English summary p. 49.]

g. POTEMKINA, V. A., 1959.—[The epizootiology of monieziasis in ruminants.] **6**, 50–56. [In Russian: English summary pp. 55–56.]

h. PETROV, A. M. & DUBNITSKI, A. A., 1959.—[The epizootiology of *Diphyllobothrium* infection in foxes and arctic foxes on animal breeding State farms in the Moscow region.] **6**, 57–70. [In Russian: English summary p. 70.]

(206d) Larvae resembling those of *Plagiorchis* were found in 10·6% of 837 *Bithynia tentaculata* from the Ivanovo and Gorkiy regions; 683 other snails collected, including *Valvata* (*Cineinna*) *piscinalis*, *Radix auricularia*, *Coretus corneus* and *Anisus* (*Anisus*) *spirorbis*, were not infected. Only *B. tentaculata* was successfully infected with *P. arcuatus*. The metacercariae were recovered from the larvae and imagines of *Coenagrion hastulatum*, *C. pulchellum*, *Lestes sponsa* and *Platycnemis pennipens*; *Libellula quadrimaculata*, *Aeshna viridis* and *Sympetrum vulgatum* were uninfected. Under experimental conditions miracidia hatched in 15 to 17 days at 20° to 25°C. and in seven to eight days at 32° to 34°C.; at 37° to 40°C. all the eggs died. Cercariae developed in 18 to 26 days at 20° to 25°C. and infective metacercariae were recovered in 60 days. *P. arcuatus* became mature five to 14 days after experimental infection of hens. The paper is illustrated with diagrams. N.J.

(206e) Parafilariasis occurs in the south and south-eastern regions of the U.S.S.R. where the climate is warm and temperate. The characteristic skin lesions do not occur in horses under two years old and these symptoms appear from April until October with occasional cases in November. Eggs were not observed to hatch below 18°C. N.J.

(206f) Autopsy of 2,963 lambs, yearlings and adult sheep, carried out in the lower Volga basin from April until the following March, showed that: (i) *Moniezia expansa* appeared in the spring, only occasional cases being observed during the winter, whereas *M. benedeni* infection was observed during the whole period; (ii) *M. expansa* predominated in lambs and *M. benedeni* in yearlings and adults; (iii) the highest incidence was among lambs; and (iv) *Thysaniezia giardi* infection was first observed among lambs in September and throughout the whole period in the other age groups. N.J.

(206g) *Moniezia expansa* and *M. benedeni* eggs did not remain infective when kept outside in sheep faeces throughout the winter. Further experiments in the Kaluga region showed that: (i) oribatid mites infected with *M. expansa* survived for 24 months and those infected with *M. benedeni* for 18 to 19 months; (ii) *M. expansa* survived for five to six months in four lambs (three experimentally and one naturally infected); (iii) those oribatids which show a preference for moist habitats were found only in the lowest 3 cm. of hay ricks; and (iv) oribatids were also found in the fodder racks and in the litter taken from stalls. Their presence in the litter could therefore be a source of monieziasis. N.J.

(206h) *Diphyllobothrium latum* infection among foxes and arctic foxes bred in the Moscow region resulted from feeding on local fish. Experimental infections of 3 adults and 9 tadpoles of *Rana temporaria* and 2 adults of *R. esculenta* gave negative results and an examination of 162 frogs, of these two species, was also negative. The percentages of viable eggs of *D. latum* from man, fox and arctic fox was found to be almost identical. Viability was destroyed by desiccation and the eggs did not survive the winter under local climatic conditions. Four foxes did not become infected when given frozen infected fish. Experimental infection of 15 foxes, five arctic foxes and nine dogs showed that the development of the parasite took 14 to 36 days and its life-span ranged from 25 to 394 days. Although 69 sables and 210 mink were fed with fish from the same source, all were negative at autopsy; 21 mink and one *Putorius putorius* fed with heavily infected fish also gave negative results. N.J.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina. (cont.)

i. PETROCHENKO, V. I. & RUDYAKOVA, N. A., 1959.—[The fresh-water mollusc fauna of the Stalingrad region and its role in spreading fascioliasis.] **6**, 71–86. [In Russian: English summary p. 86.]

j. POLYAKOVA, O. I., 1959.—[The preparation and chemistry of some helminth antigens.] **6**, 87–91. [In Russian: English summary p. 91.]

k. LUKASHENKO, N. P., 1959.—[Study of antigens obtained from *Trichinella spiralis* larvae.] **6**, 92–99. [In Russian: English summary p. 99.]

l. BELYAEVA, M. Y., 1959.—[Study of the helminth fauna of mammals in the Białowieża forest.] **6**, 100–114. [In Russian: English summary p. 114.]

m. DELYANOVA, R. S., 1959.—[The distribution of dog helminths in different geographical zones of the U.S.S.R.] **6**, 115–120. [In Russian: English summary p. 120.]

(206i) In the Stalingrad area an examination of 1,935 *Radix ovata*, *R. auricularia*, *Galba palustris* and *Lymnaea stagnalis* did not reveal any larval forms of *Fasciola hepatica*. No specimens of *G. truncatula* were found. N.J.

(206j) Polyakova has studied the chemistry of antigens from *Dictyocaulus filaria*, *Ascaris lumbricoides* and *Fasciola hepatica*, prepared by the methods of Boivin (extraction with trichloroacetic acid at low temperature), Kuzin & Polyakova (extraction with 40% glucose solution), and Melcher (extraction by heating with acetic acid). Antigens prepared by Boivin's method only, from *Trichinella spiralis* larvae, *Dicrocoelium dendriticum* and *Thysaniezia ovilla*, were also studied but no information was available to the author on the immunological activity of the two antigens from *D. dendriticum* and *T. ovilla*. The antigens were examined for nitrogen, reducing substances (before and after hydrolysis) and glucosamine. From the results, which are tabulated, Polyakova concludes that antigens obtained by the first and second methods are polysaccharide-peptide complexes, with a predominance of a specific polysaccharide composed of glucose and glucosamine. Antigens obtained by Melcher's method are principally polysaccharides, not bound to peptides or proteins. G.I.P.

(206k) [The information contained in this paper was published in 1958; for abstract see Helm. Abs., **27**, No. 46a.]

(206l) Belyaeva records, with data on hosts and frequency of occurrence, four trematodes, three cestodes, eight nematodes and one acanthocephalan from ungulates, carnivores and rodents in the Russian part of the Białowieża forest. The collections were made between 1949 and 1955. *Mastophorus petrowi* n.sp. is described and figured from the stomach of *Sciurus vulgaris*. Two other species of the genus are known from mammals. The new species differs from *M. muris* in the number of teeth on the inside of the two three-lobed oral lips (there being seven on each of the two median lobes and five on each of the four side lobes), in having six pairs of pedunculate papillae, four pre-anal and two post-anal, but no other caudal papillae, and in that the left spicule is narrower than the right and lacks alae. A description of the second species, *M. marsupialis* from Australia, was not available to the author. *Protospirura glareoli* from voles in the Białowieża forest shows similarities with the genus *Mastophorus*, but lacks a gubernaculum while *M. petrowi* possesses a horseshoe-shaped gubernaculum. G.I.P.

(206m) Of the 3,041 dogs autopsied in the U.S.S.R. for the specific purpose of detecting helminths 2,905 were found to be infected. 82 genera of helminths are recorded from these, including 24 trematodes, 25 cestodes, 30 nematodes and three acanthocephalans. 32 of the helminth species may occur in man, 15 in various ruminants, nine in horses and 20 in pigs. The results are tabulated and discussed with particular reference to the distribution of the helminths in different geographical zones of Russia. [Based on English summary.] H.H.W.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina. (cont.)

n. MATEVOSYAN, E. M. & OKOROKOV, V. I., 1959.—[Study of neotenic forms of cestodes of aquatic birds in the U.S.S.R.] **6**, 121–130. [In Russian: English summary p. 130.]

o. MATEVOSYAN, E. M. & OKOROKOV, V. I., 1959.—[Two new cestode species from *Podiceps ruficollis* and an opinion on the genus *Tatria* Kowalewski, 1904.] **6**, 131–138. [In Russian: English summary p. 138.]

p. MATEVOSYAN, E. M., GARIZHSKAYA, N. N. & KUZNETSOV, M. I., 1959.—[A study of the helminth fauna of *Saiga tatarica*.] **6**, 139–143. [In Russian: English summary p. 143.]

q. MATEVOSYAN, E. M., PETROCHENKO, V. I. & GARIZHSKAYA, N. N., 1959.—[The helminth fauna of fish in the Volga and the Tsimlyansk Reservoir in connection with a study of the distribution of opisthorchiasis and diphyllobothriasis in the Stalingrad region.] **6**, 144–155. [In Russian: English summary p. 155.]

(206n) *Nematoparataenia skrjabini* n.sp. is described from 13 neotenic specimens recovered from the intestine of *Cygnus olor* in the Chelyabinsk region. This is the first record of this genus in the U.S.S.R. The new species is placed in *Nematoparataenia* because of the shape of the scolex and is differentiated from *N. paradoxa* and *N. southwelli* by the body size (2·0 to 4·4 mm. in length) and other measurements and by the presence of only one pair of excretory vessels and 1,300 rostellar hooks, each 0·004 mm. long, lying in a single line forming ten loops. Matevosyan & Okorokov have also carefully examined and describe a neotenic larval cestode from seven species of birds; in this form the length of the rounded strobila varies from 1·8 mm. (without mature eggs) to 13·7 mm. (with mature eggs), the scolex has four large shallow suckers and there are 10 rostellar hooks and one pair of longitudinal excretory vessels. The authors conclude that this material is identical with *Gastrotaenia cygni* Wolffhügel, 1937, *Aprocta dogieli* Ginetsinskaya, 1944 (which Dubinina (1953) showed to possess suckers) and the unidentified hymenolepidid larvae found by Matevosyan in 1940 in anatids. *G. cygni* stands as the valid name. The apparent differences between these three are explained by the inadequate original descriptions. It is likely that the larval forms recorded by Cram (1926) from the duck and found again by Jones (1931) are also identical with *G. cygni*. Matevosyan & Okorokov give their reasons for erecting a separate subfamily, Nematoparataeniinae [? n.subf.], in the Hymenolepididae for neotenic hymenolepidids and give diagnoses for the subfamily and the genera *Nematoparataenia* and *Gastrotaenia*. G.I.P.

(206o) Two new species of *Tatria* from *Podiceps ruficollis* in the Chelyabinsk region are described and figured. *T. antipini* n.sp. possesses 20 hooks, each 0·119 mm. long and of a characteristic shape, 40 testes and no spines on the scolex. *T. erschovi* n.sp. has 18 testes, a rounded genital bursa 0·17 mm. in diameter and four rows of spines running from the apex of the rostellum to the unarmed suckers. The differences between the two new species and the other seven in the genus are tabulated. Matevosyan & Okorokov do not accept López-Neyra's (1953) suggestion that the species of *Tatria* are teratological specimens (maintaining that the features cited are not abnormalities, the absence of female genital pores occurring in all specimens of all species of *Tatria* and in all of the Amabiliidae), that a variation in the number of testes is a specific character and that there is now evidence of eggs being present; in both new species eggs containing oncospheres were found. Furthermore the theory of teratology in *Tatria* is supported neither by the narrow host specificity nor by the geographical distribution of its species. G.I.P.

(206p) Of the 19 nematode and four cestode species found in 17 *Saiga tatarica* from the Kalmyk A.S.S.R. the following are new host records: *Ostertagia occidentalis*, *Marshallagia dentispicularis*, *Nematodirus abnormalis*, *N. spathiger*, *Nematodirella cameli*, *Chabertia ovina*, *Trichuris ovis*, *Moniezia expansa*, *Thysaniezia giardi*, *Cysticercus tenuicollis* and *Coenurus cerebralis*. N.J.

(206q) The helminth fauna of 19 species of fishes from the Volga and the Tsimlyansk Reservoir is listed. *Opisthorchis felineus* and *Diphyllobothrium* sp. were observed only in some fishes from the Volga. Specimens tentatively identified as *Bucephalus markewitschi* were found in *Lucioperca lucioperca* from the Volga; this is a new host record. N.J.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina. (cont.)

r. POTEKHINA, L. F., 1959.—[A new intestinal trematode of the fox—*Plagiorchis dubnicki* n.sp.] **6**, 156–158. [In Russian: English summary p. 158.]
s. POTEKHINA, L. F. & BELYAEVA, M. Y., 1959.—[The occurrence of *Trichostrongylus axei* in beavers.] **6**, 159. [In Russian: English summary p. 159.]
t. PETROV, A. M. & SAVINOV, V. A., 1959.—[The helminth fauna of moles (*Talpa europaea*) in the Kalinin region.] **6**, 160–166. [In Russian: English summary p. 166.]
u. PETROV, A. M. & CHERTKOVA, A. N., 1959.—[A study of the helminth fauna of moles in the U.S.S.R.] **6**, 167–176. [In Russian: English summary p. 176.]
v. STOROZHEVA, A. M., 1959.—[The helminth fauna of domestic aquatic birds in the Grodno region and the Polesie zone of Byelorussia with regard to seasonal dynamics.] **6**, 177–182. [In Russian: English summary p. 182.]

(206r) *Plagiorchis dubnicki* n.sp., from the intestine of a fox at the central research laboratory for fur-bearing animal breeding in Moscow, is described and figured; it closely resembles *P. felineus* and *P. vespertilionis* in that the vitellaria do not extend in front of the ventral sucker but differs from them in the rather wide body, in that the ovary lies immediately behind the ventral sucker and forms an equilateral triangle with the two testes, and in having vitellaria that are well developed and meet centrally at the posterior end. Differences from other species are the anterior extent of the vitellaria, the size of the eggs (0·36×0·021 mm.) and the smooth-edged testes and ovary. G.I.P.

(206s) Autopsies on three of eight *Castor fiber*, caught in the Brest region, Byelorussia, revealed 22 to 128 *Trichostrongylus axei*. This is a new host record. N.J.

(206t) Of 52 *Talpa europaea* caught during 1949–51 in the Kalinin region, 32 were infected with nematodes, namely, *Porrocaecum* sp. larvae, *Parastrongyloides skrjabini* n.sp., *Longistriata vigisi* n.sp., *Hepaticola hepatica* and *Thominx marii* (the last two are new for this host), trematodes, namely, *Skrjabinomerus petrowi*, *Ityogonimus talpae* and *Alaria alata* metacercariae, and an unidentified immature hymenolepidid cestode. *P. skrjabini*, from the small intestine, differs from the only other species in the genus, *P. winchesi*, in having a bluntly rounded male tail lacking anal papillae and a groove-like, very wide gubernaculum. *L. vigisi* from the small intestine, is differentiated from the other two species parasitic in insectivores; it differs from *L. caudabullata* by lacking a gubernaculum and in that the externo-dorsal ray originates at the base of the dorsal ray, and from *L. depressa* in having a spicule length of 0·150 to 0·165 mm. G.I.P.

(206u) From an examination of museum collections and the literature, the authors list three trematodes, two cestodes and 14 nematodes from *Talpa europaea* in the U.S.S.R. They give notes on the occurrence of the species in Russian moles and descriptions of *Ityogonimus talpae*, *Porrocaecum* sp. larvae and *Spirura talpae*. Two other lists compiled from the literature give the helminths recorded from *T. europaea* in eastern Europe and from *Mogera robusta* in the U.S.S.R. G.I.P.

(206v) Of 892 domestic ducks and geese from the Grodno region and Polesie, 87·1% harboured helminths including ten nematode, 12 cestode, 14 trematode and two acanthocephalan species. *Drepanidotaenia przewalskii* was found in 4·7% of domestic ducks and in 32·5% of geese, these being new host records. Spirurid larvae which had been observed in domestic fowl, were also found in the ducks and geese and were identified as the infective stage of *Physocephalus sexalatus*. N.J.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina. (cont.)

w. CHERTKOVA, A. N., 1959.—[Study of *Eurytrema* of domestic ruminants in the U.S.S.R.] **6**, 183–186. [In Russian: English summary p. 186.]
x. BESSONOV, A. S., 1959.—[Ditrazine tested against *Metastrongylus* infections in pigs.] **6**, 187–190. [In Russian: English summary p. 190.]
y. VASILEV, A. A., 1959.—[Failure of ditrazine to kill lungworms in horses.] **6**, 191–194. [In Russian: English summary p. 194.]
z. DEMIDOV, N. V., 1959.—[Action of carbon tetrachloride on the motor function of the gastro-intestinal tract of sheep.] **6**, 195–202. [In Russian: English summary p. 202.]
ba. DEMIDOV, N. V., 1959.—[The effect against *Fasciola* and toxicity to the host of some synthetic organic compounds.] **6**, 203–205. [In Russian: English summary p. 205.]
bb. DEMIDOV, N. V. & POTEKHINA, L. F., 1959.—[The action of carbon tetrachloride and hexachlorethane on immature liver flukes.] **6**, 206–211. [In Russian: English summary p. 211.]
bc. DEMIDOV, N. V., 1959.—[The control of fascioliasis in sheep on a State farm in the Moscow region.] **6**, 212–215. [In Russian: English summary p. 215.]

(206w) *Eurytrema media* n.sp. from the pancreas of sheep closely resembles *E. ovis*, *E. coelomaticum* and *E. pancreaticum*; it is characterized by the body being 8·4 to 9·8 mm. long and 3·5 to 3·7 mm. in maximum width, the uterus forming a close bundle of loops in front of the ventral sucker, the two suckers being almost equal, the genital bursa being 1·435 to 1·742 mm. long with its base not reaching beyond the anterior edge of the ventral sucker, the ovary being larger than or the same size as the testes which lie level with the posterior end of the ventral sucker and the vitellaria extending from behind the ventral sucker and testes to 2·5 to 3·0 mm. from the posterior end. G.I.P.

(206x) *Metastrongylus* in ten pigs, aged four to six months, was treated with one to five intramuscular injections of ditrazine. The doses varied from 0·1 to 0·3 gm. per kg. body-weight. Although only two complete cures were obtained the efficacy of the treatment, as expressed by egg counts, was held to be good. N.J.

(206y) Dictyocauliasis in foals was treated with one to six subcutaneous injections of ditrazine in doses of 0·1 to 0·2 gm. per kg. body-weight. No positive therapeutic effect was obtained, and the larger dose caused agitation, depression and inappetence which lasted for three days. It is stated that sterilization of the solution was apparently not the cause of the ineffectiveness of the drug. 80 live *Dictyocaulus arnfieldi* were found at autopsy of one of the foals. N.J.

(206z) Carbon tetrachloride given into the rumen of sheep changed its motor function only slightly but atony of the duodenum was observed; this was especially significant when the drug was introduced into the duodenum. No effect on the motor function of either rumen or duodenum was observed when the drug was given subcutaneously. N.J.

(206ba) Trichlorotrifluoropropene was inefficient against fascioliasis and was toxic. A mixture of other organic halogen compounds, the formulae for which are given, had some effect against the infection. Neither of two samples of a mixture of the products of oxidation of liquid polymers of trifluorochloroethylene was toxic and one of them showed some effect against fascioliasis. Each of the drugs, of which empirical formulae are given, was tested on one sheep. N.J.

(206bb) Single therapeutic doses of carbon tetrachloride or hexachloroethane were given to sheep from one-and-a-half months to over two-and-a-half months after experimental infection with *Fasciola*. Both drugs were effective only against mature flukes or these reaching maturity. N.J.

(206bc) Fascioliasis was treated on a State farm by dosing all the sheep twice and following this with four treatments of animals selected because they were still showing infection. Carbon tetrachloride and difluorotetrachloroethane were used principally and the treatments were spread over 18 months. The incidence fell from 87% to 1·2% as a result and the susceptibility to other infectious diseases was greatly reduced. N.J.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina. (cont.)

bd. DEMIDOV, N. V., DERIPASKO, P. G. & KOVALEV, G. V., 1959.—[The use of difluorotetrachlorethane against fascioliasis in cattle.] **6**, 216–220. [In Russian: English summary p. 220.]

be. MALAKHOVA, E. I., 1959.—[The action of anthelmintics on the eggs and larvae of parasitic worms, passed by animals after worming.] **6**, 221–239. [In Russian: English summary p. 239.]

bf. PETROV, A. M., 1959.—[The use of chenopodium oil in veterinary helminthology.] **6**, 240–245. [In Russian: English summary p. 245.]

bg. POTEMKINA, V. A. & LUKASHENKO, N. P., 1959.—[Ditrazine and Atonin tested against ascaridiasis in chickens.] **6**, 246–247. [In Russian: English summary p. 247.]

bh. PUSTOVOI, I. F., 1959.—[Treatment of cestodes in dogs.] **6**, 248–258. [In Russian: English summary p. 258.]

bi. SHOKINA, N. P., 1959.—[*Porrocaecum* in ducks.] **6**, 259–265. [In Russian: English summary p. 265.]

bj. DEMIDOV, N. V. & SOROKINA, V. V., 1959.—[The clinical picture of monieziasis in lambs.] **6**, 266–268. [In Russian: English summary p. 268.]

(206bd) Difluorotetrachloroethane (Freon-112) was tested against liver-fluke infection in cattle. An oral dose of 1·25 ml. per kg. body-weight (one animal) proved to be lethal but 0·2 ml. per kg. was better tolerated in three other animals. All of 17 cattle, 18 months old, ceased passing fluke eggs nine days after 40 to 50 ml. of the drug had been administered into the rumen. There was no ill effect on the quantity or quality of milk in one cow observed. N.J.

(206be) To test the efficacy of anthelmintics against helminth eggs and larvae in faeces, these were counted and their viability observed during ten days preceding and ten days following treatment. The following reduced the number of eggs or larvae but did not affect their development: (i) santonin (given with calomel) and sodium fluoride when given to pigs with *Ascaris*; (ii) carbon tetrachloride when given to horses with *Parascaris* and strongyles and to sheep with *Fasciola*; (iii) ditrazine when given to sheep with *Dictyocaulus*; (iv) aqueous solution of iodine when given to sheep and calves with *Dictyocaulus* and to pigs with *Metastrongylus*; (v) hexachloroethane when given to cattle with *Fasciola*. When given to sheep hexachloroethane did not reduce the number of strongyle eggs in the faeces. Both numbers and viability of eggs were reduced by phenothiazine in sheep and horses with Strongylata, and by hexachloroethane in horses with Strongylata. N.J.

(206bg) Ditrazine in doses of 0·5 to 1·0 gm. completely cured 17 of 24 domestic fowls infected with *Ascaridia*. 2 gm. of Atonin (*Artemisia terra alba* extract) was given to eight and 3 gm. to ten chickens, followed by 5 to 6 gm. of Glauber's salt; six birds were completely cured. N.J.

(206bh) Filixan proved to be the most effective of the drugs used against cestodes in 396 dogs. Its efficacy ranged from 55·5 to 100%. Doses of 0·2 gm. to 0·3 gm. per kg. body-weight were more effective in dogs over 15 kg. but 0·4 gm. per kg. was better in animals weighing less than 15 kg. Doses of 0·6 to 0·8 gm. per kg. were toxic. Therapeutic doses of acrichin and carbachol were ineffective. Aminoacrichin at 0·2 gm. per kg., repeated after ten days, was efficacious. Its effect was increased when the dose was followed by 1 mg. of carbachol per kg. body-weight. N.J.

(206bi) The highest incidence of *Porrocaecum crassum* was observed in ducks two to two-and-a-half months old and during June and July (in Georgia, U.S.S.R.). Treatment of about 200 young birds showed carbon tetrachloride and *n*-butylidene chloride to be completely effective at doses of 2 ml. and 3 ml. per kg. body-weight respectively. These particular doses were given to 35 and 13 ducks respectively, the other 152 birds receiving smaller doses. Tetrachlorethylene, sodium fluoride, ditrazine, phenothiazine and hexylresorcinol had little or no effect in non-toxic doses and caused pathological changes. N.J.

(206bj) Two fatal cases of monieziasis in lambs, in which there were nervous symptoms similar to those caused by coenuriasis, are described. In one case anthrax was also suspected. N.J.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina. (cont.)

bk. LOGGINOV, S. B., 1959.—[The reaction of the body fluid of *Parascaris* and of its environment.] **6**, 269–272. [In Russian: English summary p. 272.]

bl. LOGGINOV, S. B., 1959.—[The toxicity of live *Parascaris*.] **6**, 273–281. [In Russian: English summary p. 281.]

bm. POLYAKOVA, O. I., 1959.—[Biochemical changes in sheep caused by dictyocauliasis.] **6**, 282–289. [In Russian: English summary p. 289.]

bn. PANASYUK, D. I., 1959.—[The clinical course and pathogenesis of dictyocauliasis in sheep.] **6**, 290–337. [In Russian: English summary p. 337.]

(206bk) It was shown by an electrometer that the *p*H of *Parascaris* body fluid varies from 6·86 to 8·82, that the fluid from the anterior end is more alkaline than that from the posterior end, that with loss in viability the *p*H falls to 5·7 to 5·9 and that this change spreads from the posterior to the anterior end of the worm. The *p*H of the contents of the small intestine from 13 foals and horses varied from 6·79 to 9·0; that of the jejunum was highest (7·5 to 9·0), most constant and nearest to the optimum value of the ascarid body fluid. G.I.P.

(206bl) No toxic substances were either excreted or secreted by *Parascaris* when these remained viable for 7 to 12 hours after removal from the horse. When *Parascaris* were placed in a non-nutrient medium (i.e. in carbohydrate-free Locke's solution, lacking both glucose to discourage bacterial growth and antibiotics to keep the solution nitrogen free), nitrogenous substances accumulated in the solution which, by the ninth to tenth hour, included somatic proteins from the worms. After 21 to 23 hours, i.e. at the death of the worms, the concentration of somatic proteins had reached 370 to 438 mg.%. With the appearance of the somatic proteins the biological activity of the solution increased. Intravenous injection of the solution containing somatic proteins into guinea-pigs produced shock or death, the severity of intoxication being directly dependent on the amount of somatic protein injected. During necrosis, the cuticle of the worms separated into layers interspersed with vacuoles, which on rupture released their liquid containing the somatic proteins into the surrounding medium. G.I.P.

(206bm) Biochemical methods were used to determine the amount of nitrogen, polypeptides, potassium and respiratory enzymes in the blood of five lambs experimentally infected with *Dictyocaulus* and six sheep naturally infected with the nematode. It was found that the larvae had a serious effect on respiration, immediately on entering the sheep, causing both an increased concentration of polypeptides in the blood and a doubling of the activity of peroxidase. It is suggested that these two effects, together with clinical data, may be used for the diagnosis of dictyocauliasis. In the lungs *Dictyocaulus* causes both mechanical and chemical damage. [Based on English summary]. H.H.W.

(206bn) In order to study dictyocauliasis some sheep were experimentally infected with *Dictyocaulus filaria* and autopsied from 14 hours to 176 days after the infection while others, naturally infected with the nematode, were also investigated. The experimental infections were successful *per os*, through the skin of the groin and abdominal regions, subcutaneously and intraperitoneally. It was found that most of the larvae reached the lungs 15 to 30 days after the infection but some took 115 to 123 days. They matured 34 to 81 days after infection but not more than 16% of the administered larvae survived in the sheep. The effects of *D. filaria* on the nervous system, blood, temperature regulation, respiration, digestion and metabolism were observed. The nervous system was affected directly by the mechanical and chemical effects of the larvae and indirectly by the accumulation of toxic substances in the blood. Anaemia, eosinophilia and changes in the blood pressure also took place. Damage to the lungs affected external respiration while biochemical investigations of the blood and the accumulation of urochromes in the urine suggested that tissue respiration was also impaired. These effects together with accelerated peristalsis and diarrhoea alternating with constipation resulted in poor growth and development, thus causing heavy losses in meat production and the loss of resistance to other helminths. Numerous figures, graphs and tables illustrate the results. H.H.W.
N.J.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina. (cont.)

bo. TSVETAEVA, N. P., 1959.—[Pathological changes in the intestine of ducks with *Filicollis* infection.] **6**, 338–346. [In Russian: English summary p. 346.]
bp. TSVETAEVA, N. P., 1959.—[Pathological changes caused by dictyocauliasis in sheep.] **6**, 347–373. [In Russian: English summary p. 373.]
bq. TSVETAEVA, N. P., 1959.—[Pathology of *Plagiorchis* infections in chickens.] **6**, 374–386. [In Russian: English summary p. 386.]
br. SKARBILOVICH, T. S., 1959.—[The family Heteroderidae Skarbilovich, 1947, and its systematic position.] **6**, 387–394. [In Russian: English summary p. 394.]
bs. SKARBILOVICH, T. S., 1959.—[*Hexatylus* infection of potatoes.] **6**, 395–400. [In Russian: English summary p. 400.]
bt. SKARBILOVICH, T. S., 1959.—[The ecology of and diseases caused by the beet nematode.] **6**, 401–410. [In Russian: English summary p. 410.]

(206bo) Examination of the intestines of about 29 ducks with *Filicollis anatis*, of which seven were experimentally infected, showed that the pathological changes occurred in three stages. The first stage, corresponding to the penetration and fixation of the parasite in the intestinal wall, is of an inflammatory-exudative character and lasts for about eight to ten days. During the second stage suppuration and necrotic ulceration occur and the formation of parasitic granulomata commences. The third stage corresponds to the termination of the infection during which the body of the worm is detached and is characterized by proliferation and regeneration around the proboscis and neck which remain embedded in the intestinal wall where they are gradually destroyed and replaced by fibrous and scar tissue. N.J.

(206bp) Tsvetaeva describes in detail the pathological changes caused by acute and chronic dictyocauliasis in 39 experimentally and in 17 naturally infected sheep. The three phases of the acute stage, intestine-lymphatic, intrapulmonary and microbronchial, were longer in natural than in experimental infections. The use of expectorants after treatment is said to be essential to eliminate dead worms. N.J.

(206bq) Examination of *Plagiorchis arcuatus* infection in 15 naturally infected domestic fowls and eight experimentally infected chicks, showed that the parasites fed on the cellular elements as well as on the tissue juices of the host. The infection disturbs the structure and the function of the oviduct. Examination of simultaneous infection with *Plagiorchis* and *Prosthogonimus* showed that the former were situated throughout the oviduct, while the latter were mainly in the uterus, i.e. the enlarged caudal end of the oviduct. N.J.

(206br) [This is essentially a shortened version of a paper published by Skarbilovich in 1959 in *Acta parasit. polon.*, **7**, 117–132; for abstract see Helm. Abs., **28**, No. 1d. In both papers it is stated that Heteroderata was erected by Skarbilovich in 1957 and the reference is quoted as Sandner, 1957, "Wrażenia z podróży naukowej do Związku Radzieckiego" in *Kosmos, Warszawa*, Seria A. Biologia, **6** (2), 185–191. However, in his paper Sandner states that he saw only the typescript of the monograph by Skarbilovich in which she revises Heteroderidae and proposes the suborder Heteroderata.] G.I.P.

(206bs) Leaves, stalks and tubers of potatoes were found to be infected with *Hexatylus vigissi*, causing the plants to wither and reducing the crops to about half or a third of those from healthy plants. Under experimental conditions seven of 50 healthy tubers became infected when kept with infected tubers at 10° to 12°C.; at 3° to 5°C. four of 50 healthy tubers became infected. N.J.

(206bt) The development of *Heterodera schachtii* was slow at 11° to 15°C.; at 16° to 18°C. 19 of 41 sugar-beet plants became infected. Low temperatures impaired the development of the nematode. Strong solutions of superphosphate, potassium salts and ammonium sulphate killed larvae within the cysts but weak solutions stimulated excystment. Hatching was also stimulated by strong and weak solutions of sylvinite but was inhibited when the experimental pots were watered with a 5% solution of a filtrate of cattle manure. All cysts which remained in the presence of this filtrate for 15 days contained fungal mycelia which penetrated the eggs. A brief account of fungal and nematode infections of beet nematode cysts is also given. N.J.

206—Trudi Vsesoyuznogo Instituta Gelmintologii im. K.I. Skryabina. (cont.)

bu. SKARBILOVICH, T. S. & POTEKHINA, L. F., 1959.—[Studies on the nematode fauna of *Panax ginseng*.] **6**, 411–414. [In Russian: English summary p. 414.]

bv. KHARICHKOVA, M. V., 1959.—[The control of *Ditylenchus* infection of onions on a collective farm in the Kolomna district of the Moscow region.] **6**, 415–418. [In Russian: English summary p. 418.]

(206bu) Ten plants from a *Panax ginseng* plantation in the Teberdinsk preserve where some of the plants were dying off, were examined for nematodes. Of the 12 nematodes found two species were true parasites; these were *Aphelenchoides parietinus*, which was rare, and a new species, *A. panaxi* n.sp., which was very common. *A. panaxi* is described and figured. It differs from a large number of the species of *Aphelenchoides* (named) parasitic in plants by the shape of the tail which is conoid and pointed forming a spine at the tip and by the smooth cuticle. *A. ribes*, *A. fragariae* and *A. besseyi* are strictly specific to their hosts and *A. ritzema-bosi* parasitizes Compositae. Three other species of the genus resemble *A. panaxi* very closely but it differs from *A. parietinus* by the well pronounced basal swellings on the stylet and by the excretory opening behind the oesophageal bulb; from *A. kühni* by the smaller stylet (9 to 10μ) and larger spicule (23 to 26μ) and from *A. helophilus* by the smaller body length (females 644 to 736μ, males 597 to 625μ). G.I.P.

(206bv) Careful prophylaxis, including the use of calcium hypochlorite, and in other cases, treatment of soil with 200 gm. of quicklime per sq.m., eliminated *Ditylenchus dipsaci* from onions. *D. dipsaci* is capable of producing three to four generations during a vegetative period; it was not found in about 1,000 weeds examined, belonging to 15 genera and growing abundantly in onion fields. N.J.

207—Tulane Studies in Zoology. New Orleans.

a. SOGANDARES-BERNAL, F., 1959.—"Digenetic trematodes of marine fishes from the Gulf of Panama and Bimini, British West Indies." **7** (3), 69–117.

(207a) Sogandares-Bernal reports on collections of digenetic trematodes made in the Gulf of Panama in 1956 and at Bimini, British West Indies in 1957. He examined 484 fishes representing 208 species and found 88 species of Digenea including two new genera and 17 new species. 29 new host records and many new locality records are reported. Each of the new genera and species is fully described and figured. *Dollfustrema muraenae* n.sp. from *Gymnothorax vicinus* resembles *D. vaneyi* in having the testes side by side but differs by having a post-equatorial mouth, a pharynx opposite the anterior edge of the cirrus sac and a caecum which extends only two-thirds of the distance between the pharynx and the rhynchus. *Pseudocreadium biminensis* n.sp. from *Balistes capriscus* differs from *P. galapagoensis* by, amongst other characters, having vitellaria which extend only to the posterior edge of the oral sucker, a sucker ratio of 1: 0·51 to 0·89 and by the transverse, median, external seminal vesicle. *Lepidapedon truncatum* n.sp. from *Holocentrus ascensionis* is closest to *L. hancocki* and *L. nicolli* but differs by having separated diagonal testes, a distinctly trilobed ovary and a truncated posterior end to the body. *L. parepinepheli* n.sp. from *Epinephelus tigris* differs from *L. levenseni* chiefly by having a sucker ratio of 1: 1·11 to 1·29 and in that the posterior edge of the external seminal vesicle lies two-thirds the distance between the acetabulum and the ovary. *L. parepinepheli* is most closely related to *L. epinepheli* differing in that the posterior seminal vesicle of *L. epinepheli* is almost always twice as long as the cirrus sac, whereas that of the new species is approximately half the length of the cirrus sac and never longer; also, the posterior tip of the posterior seminal vesicle lies two-thirds the distance between the acetabulum and the ovary in the new species, whereas in *L. epinepheli* it lies never more than half the distance between the acetabulum and the ovary. *Cableia trigoni* n.g., n.sp. from *Lactophrys trigonus* differs from both *Stegodexamene* and *Proenenterum* in the possession of a uroproct and also from *Stegodexamene* by having tandem post-equatorial testes and from *Proenenterum* by having an elongated cirrus sac. *Apocreadium coili* n.sp. from *B. capriscus* and *B. vetula* differs from all other species of the genus

in the short post-testicular region, in the acetabulum being far back near the midbody and in that the vitellaria are confluent anterior to the acetabulum. *A. angustum* n.sp. from *L. trigonus* differs from *A. coili* in the narrower body with much longer testes and in the considerably smaller eggs. *A. uroproctoferum* n.sp. from *B. vetula* differs from all other species of the genus in possessing a uroproct. *A. bravoi* n.sp. from *B. naufragium* differs from *A. coili* in the sucker ratio of 1 : 0·7 to 0·8 and in the much longer post-testicular region. *Stephanostomum provitellosum* n.sp. from *B. naufragium* and *B. polylepis* differs from all other species of the genus by the possession of a transverse band of vitelline follicles anterior to the acetabulum with the follicles interrupted at the level of the acetabulum. The new species is probably of the *S. dentatum* type differing in details of the vitellaria and by having a uroproct; it resembles *S. casum* in the possession of a uroproct but differs in the distribution of the vitellaria and the number of oral spines. *S. pseudocarangis* n.sp. from *Holocentrus ascensionis* differs from *S. carangis*, *S. microcephalum* and *S. pseudovitellosum* by possessing a spinous metraterm. *Myodera magna* n.sp. from *Kyphosus elegans* differs from *M. medialunae* by, among other characters, having a non-muscular anterior region of the uterus, in that the external seminal vesicle extends almost to the ovary and in the absence of papillae from the posterior end of the body. *Megasolena kyphosi* n.sp. from *K. analogus* differs from *M. estrix* in having vitellaria which are both confluent between the ovary and anterior testis and between the testes. *Podocotyle mycteropercae* n.sp. from *Mycteroperca falcata* differs from *P. gracilis* and *P. pedicillatum* by having vitellaria which do not reach the acetabulum and an almost median genital pore, from *P. petallophallus* in possessing a smooth cirrus, short stalked acetabulum and with vitellaria ending at the anterior edge of the ovary, from *P. epinepheli* and *P. mecopera* in the sucker ratio of 1 : 1·83, the almost straight seminal vesicle and the almost median genital pore situated between the caecal bifurcation and the acetabulum, and from *P. serrani* chiefly in that the vitellaria do not extend anteriorly much past the ovary, in the more anterior acetabulum and in the sigmoid-shaped cirrus sac which extends for at least half its length posteriorly behind the acetabulum. *Pachycreadium lerneri* n.sp. from *Gerres cinereus* differs from *P. gastrocotylum* in the sucker ratio of 1 : 2·33, the smaller pharynx, the vitellaria not being confluent anterior to the acetabulum and by having testes which are longer than broad. *Gonacanthella lutjani* n.g., n.sp. from *Lutjanus jordani* (?) differs from *Metadena* by having a spined gonocotyl and a smooth ovary. *Sterrhurus tabogonus* n.sp. from *Gymnothorax dovii* differs from all other species of the genus by possessing a large bundle of semi-circular muscle fibres along the posterior rim of a fore-body concavity. Sogandares-Bernal considers the following to be synonyms: *Bianium lecanocephalum* of *Diploproctodaeum haustrum*, *Pseudocreadium myohelicatum* of *P. scaphosomum*, *Stephanostomum cubanum* and *S. manteri* of *S. ditrematis*, *S. mediovitellarium* and *S. lopezneyrai* of *S. sentum*, *S. admicrostephanum* of *S. microstephanum* and *Tubulovesicula anguillae*, *T. serrani* and *T. spari* of *T. lindbergi*. The genus *Proneochasmus* is considered a synonym of *Paraspina*, so *Proneochasmus argentinensis* becomes *Paraspina argentinensis* n.comb. The *p*H of the stomach contents of *Haemulon sciurus* ranged from 3·0 to 7·7, that of the pyloric caeca from 5·0 to 7·8 and that of the intestine from 5·3 to 8·2. The author suggests that trematodes of the digestive tract of marine fishes probably experience a greater variation in *p*H than do free-living marine animals. Some observations on the ecology of the parasites within their hosts are given. The Digenea of Bimini are very similar to those known from Tortugas, Florida, and from Bermuda. A list of the number of individuals of each host species that were infected together with the number of parasites found in each host is given. There is a bibliography of 51 references. J.W.S.

208—Türk Veteriner Hekimleri Derneği Derğisi.

a. OYTUN, H. S., 1959.—"(Hydatidose) a dair sorulan sorularin karsiliklari." **29** (152/153), 255–259.

b. GÜRALP, N., 1959.—"Radioaktiv isinlarin parazitolojiye tatbiki ve alinan sonuçlar." [The effect of radiation on some parasitic diseases.] **29** (152/153), 290–296.

209—Uchenie Zapiski Kazanskogo Gosudarstvennogo Veterinarnogo Instituta im. N.E. Baumana.

a. MESHCHERYAKOV, P. A., 1959.—[Pathogenesis of ascaris intoxication. Part III. The effect of ascaris toxin on animals with a changed functional activity of the nervous system and the role of the liver and intestinal epithelium as a barrier to ascaris toxins.] **71**, 193–200. [In Russian.]

b. GATIN, P. P., 1959.—[Treatment and prophylaxis of *Thelazia* infections in cattle.] **71**, 201–204. [In Russian.]

(209a) Meshcheryakov describes the effect of ascaris intoxication on the cardiovascular system of dogs. Injection of the toxins into the venous system doubled the heart rate and reduced blood pressure to 39% of its normal value. He then proceeds to study the action of ascaris toxins on the nervous system by changing conditions through the interception of the vagus nerve or the action of such compounds as atropine, carbocholine, adrenalin and others. G.I.P.

(209b) For prophylactic purposes against *Thelazia*, Gatin carried out mass treatment of cattle with 5% aqueous collargol in December and again at the end of the winter period in April. Three to four drops for cattle and two to three drops for calves were introduced into each eye in the morning and evening of the day of treatment. On appearance of kerato-conjunctivitis in the spring–summer period this treatment was repeated and combined with subcutaneous novocain-penicillin injections. Relief of catarrhal kerato-conjunctivitis was obtained after five to six days and of ulcerating keratitis 12 to 18 days after a second injection five to six days later. G.I.P.

210—Veterinär-Medizinische Nachrichten. Marburg.

a. SEIFERT, H., 1959.—"Bekämpfung der Ekto- und Endoparasiten bei Rindern und Schafen in Perú." Year 1959, No. 3, pp. 118–135.

(210a) In Peru, the most important endoparasites of cattle and sheep are stomach worms in the Cordillera region. Ascarids are of importance in horses only and liver-fluke occurs under special conditions on coastal pastures and in the mountains. Neguvon, in the recommended dosage, was shown to suit local conditions and, given individually or as a mass treatment in food or with salt, reduced the gastric worm burden and also freed the animals from ticks. G.I.P.

211—Veterinaria Italiana.

a. CORSALINI, T., 1959.—"Frequenza dell'idatidosi nei soggetti delle diverse specie animali macellati a Bari." **10** (8), 644–647. [English, French & German summaries pp. 646–647.]

b. PELLEGRINI, D., 1959.—"Recenti acquisizioni sulla idatidosi." **10** (8), 648–658.

c. NARDI, E. & GRIMALDI, A., 1959.—"Ricerche preliminari sull'attività del 'Neguvon' contro i nematodi intestinali del cane." **10** (11), 917–921.

(211a) The incidence of hydatid among equines and pigs slaughtered at the Communal Abattoir at Bari during 1958 was insignificant. It was 14·70% and 13·89% respectively in young and adult cattle and 5·91% and 93·41% respectively in young and adult sheep. N.J.

(211b) In this review the author discusses the specific independence of *Echinococcus granulosus* and *E. multilocularis* and concludes that it is only the dog that can be considered responsible for the distribution of *E. granulosus* under natural conditions. He goes on to discuss the treatment of dogs and the possibility of acquired resistance to reinfections. N.J.

(211c) Administration of Neguvon (*o,o*-dimethyl-2,2,2,-trichloro-oxyethylphosphonate) *per os* to eight dogs at doses of 50 mg. to 100 mg. per kg. body-weight produced no ill effects. In subsequent treatment of ten dogs 80 mg. of the drug per kg. were used. Autopsies on the seventh day after treatment showed that the drug had a particularly good effect against *Uncinaria stenocephala* and *Toxocara canis* but practically none against *Ancylostoma caninum* or *Spirocerca lupi*. One of the ten dogs had diarrhoea between the first and the third hour after treatment. N.J.

212—Yearbook. California Avocado Society.

a. SHER, S. A., 1959.—"Nematodes in avocados." **43**, 91–93.

(212a) The chief nematode pest in avocados in California is *Pratylenchus vulnus*. Sher established the pathogenicity of this nematode in green-house tests; field tests indicated that pre-plant fumigation with D-D should be made on land containing this nematode when avocado is to be grown. The planting of avocado after walnuts may result in damage to the avocados by *P. vulnus*. H.R.W.

213—Zashchita Rasteni ot Vreditelei i Boleznei.

a. TRESKOVA, V. S., 1959.—[Trace elements and nematostatic compounds in the control of the root-knot nematode.] Year 1959, No. 5, pp. 26–27. [In Russian.]
b. KULCHITSKI, B. I., 1959.—[Methods of control of the beet eelworm.] Year 1959, No. 5, p. 27. [In Russian.]
c. PETROVA, Z. I., 1959.—[Treatment of soil against the stem nematode.] Year 1959, No. 5, p. 28. [In Russian.]
d. MYUGE, S. G., 1959.—[A chemical method of diagnosing *Ditylenchus destructor* on potatoes.] Year 1959, No. 5, p. 41. [In Russian.]
e. TIKTIN, N. V., 1959.—[Detection of the potato-root eelworm in the soil.] Year 1959, No. 5, p. 43. [In Russian.]
f. BELOKURSKAYA, V. I., 1959.—[Chloropicrin in the control of the potato-root eelworm.] Year 1959, No. 5, p. 48. [In Russian.]
g. PARAMONOV, A. A., 1959.—[Urgent problems of plant nematology.] Year 1959, No. 6, pp. 25–28. [In Russian.]
h. KIRYANOVA, E. S., 1959.—[The distribution of nematodes in the soil and in plants.] Year 1959, No. 6, pp. 28–29. [In Russian.]
i. USTINOV, A. A. & TERESHCHENKO, E. F., 1959.—[The potato stem nematode.] Year 1959, No. 6, pp. 29–31. [In Russian.]
j. DUNIN, M. S., 1959.—[Biological control of plant eelworms.] Year 1959, No. 6, p. 32. [In Russian.]
k. IVANOVA, T. A., 1959.—[New data on *Heterodera major*.] Year 1959, No. 6, pp. 33–34. [In Russian.]
l. POPOVICH, A. S. & VOITENKO, A. N., 1959.—[Steam treatment of soil in green-houses for the control of root-knot nematode.] Year 1959, No. 6, pp. 34–35. [In Russian.]
m. DAMANSKAYA, L. Y., 1959.—[Control of root-knot nematode.] Year 1959, No. 6, p. 41. [In Russian.]

(213a) Treskova briefly describes experiments with tomatoes which showed that copper, manganese and boron stimulate the plant, increase its resistance to the root-knot nematode and reduce the fertility of the female worms. The effect was even more pronounced in the case of the sodium salicylate and ammoniacal saltpetre. G.I.P.

(213d) *Ditylenchus* infection of an otherwise healthy-looking potato plant leads to an increase in the monosaccharides in its leaves (from 1·2–1·5% to 1·6–2·2%) and can thus be detected by the following method: to 100 mg. of leaves (about three pieces of 13 mm. diameter) in 1 ml. to 2 ml. of water, 1 ml. of a 0·05N alkali solution of potassium ferrocyanide is added; after 20 minutes heating in boiling water, 1·5 ml. of reagent (6 gm. zinc sulphate in 100 ml. of water, 3 gm. potassium iodide and 2 gm. to 3 gm. of starch indicator) are added; a blue coloration indicates less than 1·5% of glucose. The amount of reagent is raised for potato varieties with normally higher amounts of sugars in the leaves. Saprophytic nematodes are excluded by staining with 1% methylene blue when they, but not *Ditylenchus*, become stained. The method can similarly be used for the detection of the root-knot nematode in, for example, tomatoes and cucumbers. G.I.P.

(213m) A Russian preparation of Vapam (sodium salt of methyldithiocarbamic acid) tested against the root-knot nematode on tomatoes was most effective when applied at 20 gm. to 50 gm. per sq.m. of soil. G.I.P.

214—Zoologické Listy. Brno.

a. LUCKÝ, Z., 1959.—"Výsledky dosavadního výzkumu parazitofauny ryb řeky Rokytné." **8** (3), 213–225. [German summary p. 225.]

(214a) Lucký lists with brief comments the parasites of 61 fishes belonging to 14 species which came from the river Rokytná (Czechoslovakia). The list comprises 23 species of monogenetic trematodes, four of digenetic trematodes, four of cestodes, two of nematodes and a *Hemiclepsis marginata*. Of the seven *Gyrodactylus* species mentioned two are reported for the first time in Czechoslovakia [but are not specifically named]. N.J.

215—Zooprofilassi.

a. MIOLI, M. & PIERACCI, F., 1959.—"Particolare aspetto della trichurosi in suini." **14** (5), 315–323. [English & French summaries pp. 322–323.]
b. BONO, G. DEL & PELLEGRINI, N., 1959.—"Enzoozia nel coniglio da *Distomum hepaticum* Linné, 1758." **14** (6), 379–391. [English & French summaries p. 391.]
c. FAVATI, V., 1959.—"Sulla diffusione delle strongilosi polmonari degli ovini in Toscana." **14** (9), 669–676. [English summary p. 721.]
d. SGAMBATI, A., 1959.—"La cisticercosi bovina nelle sue localizzazioni." **14** (9), 679–687.

(215a) Mioli & Pieracci report on six cases of *Trichuris trichiura* infection in pigs all accompanied by pleurisy and purulent broncho-pneumonia with necrotic and gangrenous foci. They suggest that this lends support to the view expressed by Neveau-Lemaire that pulmonary migration is a feature of the cycle of this species. The lung tissues, weakened by the passage of *Trichuris* larvae, became susceptible to invasion by *Pasteurella* spp. and *Corynebacterium* spp. isolated from the lesions. W.M.F.

(215b) Bono & Pellegrini report on a study of an outbreak of *Fasciola hepatica* infection in rabbits in Italy. Five rabbits, two naturally dead and three killed, were examined post mortem. Clinical manifestations were scanty; hydrothorax, ascites, oedema and icterus were not observed, the only symptom being loss of condition. Macroscopic and histological post-mortem changes are described in some detail and particular emphasis is laid on the granulomata which surround the bile-ducts—a condition considered to be characteristic for this species. W.M.F.

(215c) Favati investigated pulmonary strongylosis of sheep in Tuscany, Italy, and records *Dictyocaulus filaria*, *Protostrongylus rufescens*, *Cystocaulus ocreatus*, *Muellerius capillaris* and, a new record for Italy, *Neostrongylus linearis*. He records data on incidence and distribution. W.M.F.

216—Züchter.

a. ROTHACKER, D. & STELTER, H., 1959.—"Beiträge zur Resistenzzüchtung gegen den Kartoffelnematoden (*Heterodera rostochiensis* Wollenweber). IV. Das Verhalten von resistenten Bastardklonen aus der Kreuzung zwischen *S. tuberosum* subsp. *tuberosum* mit *S. tuberosum* subsp. *andigenum* auf nematodenverseuchten und nematodenfreien Flächen." **29** (5), 241–251.

(216a) On land infested with *Heterodera rostochiensis* and on uninfested land, Rothacker & Stelter grew resistant crosses of *Solanum tuberosum* subsp. *andigenum* with European cultivated potato varieties (*S. tuberosum* subsp. *tuberosum*) and back-crosses of these crosses with the cultivated varieties. On infested land the new resistant varieties suffered a temporary growth check, due to invasion of the roots by eelworm larvae. This set-back was usually associated with some reduction in yield, but on the whole they performed much better than the susceptible cultivated varieties and greatly reduced the eelworm infestation. On uninfested land a few of the back-crosses gave yields comparable to those of the cultivated varieties, and growth of such resistant potatoes on infested land, followed by three to four years of "neutral" crops such as cereals, is recommended as a practical means of controlling potato-root eelworm. Data are given for various tuber characteristics—average tuber weight and number per plant, shape, colour of flesh and starch content. R.D.W.

NON-PERIODICAL LITERATURE

217—LAIRD, M. & LAIRD, E., 1959.—"Culicidae and haematozoa from Bellona and Rennell." Natural History of Rennell Island, British Solomon Islands, **2** (30), 213–234.

Laird & Laird describe and figure *Microfilaria bruuni* n.sp. from a white-collared kingfisher (*Halcyon chloris amoena*) collected during a survey on the islands of Bellona and Rennell, British Solomon Islands. Many small, unsheathed microfilariae were present in two blood films. The microfilariae are broadly rounded anteriorly and taper posteriorly, the caudal extremity sometimes appearing hooked. Measurements of 50 show a range in length of 56·5 to 106·6μ, and breadth of 3·0 to 5·0μ. Whilst the nerve ring is seldom evident, the excretory and first and second genital cells usually are. Relative distances of various structures from the anterior end, expressed as percentages (to the nearest whole number) of the over-all length, are as follows: nerve ring (21%); excretory cell (34%); central body (62%); first genital cell (73%); and the second genital cell (85%). Morphologically similar microfilariae have been reported from a Sudanese hornbill and guinea-fowl by Neave (1906). The authors discuss the relationship of the new species to other Filarioidea. J.W.S.

218—LINDHARDT, K., 1959.—"Kartoffelål. En samlet oversigt." Copenhagen: Statens Planteilsyn Oplysende Skriftraekke, 52 pp.

A review of the potato-root eelworm (*Heterodera rostochiensis* Woll.) is given, covering its morphology and biology. The multiplication of the nematodes is discussed as are its host plants and symptoms on the host plants. The distribution of the potato-root eelworm is described with details referring especially to Danish conditions. The means of distribution and the economic importance of an attack are also discussed. Soil sampling and laboratory analyses are described and illustrated. In Denmark 15 to 20,000 samples are investigated each year. Control methods are discussed in some detail. By growing potatoes only every fourth year it is possible to keep the attack on such a level that no economic damage is caused. Control by chemicals and by breeding for resistance are discussed. The importance of preventing the spread of the nematodes is stressed. S.B.

219—POLYANSKI, Y. I. [Editor], 1959.—[Ekologicheskaya Parazitologiya.] Leningrad: Izdatelstvo Leningradskogo Universiteta, 204 pp. [In Russian.]

a. BELOPOLSKAYA, M. M., 1959.—[The parasite fauna of birds of the Sudzukhinsk preserve (Primore). III. Nematodes.] pp. 3–21.
b. BELOPOLSKAYA, M. M., 1959.—[The parasite fauna of Charadriiformes of the coasts of the Sea of Japan and the Barents Sea.] pp. 22–57.
c. VOLGAR-PASTUKHOVA, L. G., 1959.—[The parasite fauna of Anura of the Danube delta.] pp. 58–95.
d. GINETSINSKAYA, T. A., 1959.—[Cercarial fauna of molluscs from the Rybinsk water reservoir. I. Systematic survey of cercariae.] pp. 96–149.
e. GOLIKOVA, M. N., 1959.—[Ecological and parasitological study of the biocoenosis of some lakes in the Kaliningrad region. II. Parasite fauna of birds.] pp. 150–194.
f. SHTEIN, G. A., 1959.—[The parasite fauna of aquatic arthropods from some lakes in Karelia. III. Larval Acanthocephala from crustaceans.] pp. 195–204.

(219a) 50 species of nematodes are listed from 53 of 148 species of birds collected during 1943–45 in the Sudzukhinsk preserve area. For each nematode the following data are given: the numbers of each host infected, the intensities of infection, the month of collection and, for some, morphological data. The nematodes are also listed under hosts. *Subulura strongylina*, *Diplotriaena manipoli* and *Serratospiculum chungi* are new for the U.S.S.R. A female is described from the body-cavity of *Caprimulgus indicus jotaka* which belongs to the Filariidae but has a posterior vulva. This parasite fauna was specifically poorer than that of western Siberia. [For abstract of paper describing the Acanthocephala from this bird collection see Helm. Abs., **29**, No. 1343 and for the description of the trematode fauna see *Uchenie Zapiski Leningradskogo Gosudarstvennogo Universiteta*, 1954, No. 172, Ser. Biol. (32), pp. 3–34.] G.I.P.

(219b) This is a list of the parasites collected from 28 species of charadriiform birds caught while nesting on the islands of eastern Murmansk or during migration in the Primore area. 35 trematodes, 33 cestodes, 12 nematodes, eight acanthocephalans and 47 ectoparasites are recorded with details of their hosts and exact locality. They are also listed under hosts. Belopolskaya quotes eight previous papers published by her on the helminths of this collection. G.I.P.

(219c) The helminth fauna of 1,234 adults and tadpoles of *Rana ridibunda*, *R. esculenta*, *Bufo viridis*, *Bombina bombina*, *Hyla arborea* and *Pelobates fuscus* in the Danube delta was represented by 30 species of trematodes, 12 of nematodes and two each of cestodes and acanthocephalans. 26 of these were larval forms; one leech, *Hemiclepsis marginata*, was also present. Details of the infections are given under each of the helminths and a number of new host records are made. The character of the fauna in each host is considered and its dependence on the age and mode of life of the hosts (e.g. aquatic, arboreal), on annual weather conditions and on the physiological state of the hosts is discussed. G.I.P.

(219d) This work on the larval trematode fauna of 28 species of molluscs in the Rybinsk reservoir is published in two parts. This systematic part (part I) records 45 species of cercariae with details of the infections and data on the morphology and biology of some. Descriptions and illustrations of the following 13 new species are given [the names of these new species were also mentioned in part II, on the influence of ecological factors on this trematode fauna, which was published in *Vestnik Leningradskogo Universiteta. Seria Biologii*, **14** (21), pp. 62–77; for abstract see Helm. Abs., **31**, No. 589]. *Cercaria* n.sp., of *Phyllodistomum* (*Phyllodistomum*) sp., found in *Pisidium amnicum*, closely resembles *C. flagellifera* but differs from it in the longer tail (2·12 mm.), the equal suckers (0·064 mm. in diameter) and the absence of a pharynx; this cercaria may be that of *Phyllodistomum angulatum*, common in the pike-perch in this reservoir. *C. spinulosa* n.sp. (Strigeidae) from *Lymnaea stagnalis* is the only known furcocercaria with a transverse commissure of the excretory system in which the penetration glands (two pairs) lie behind the ventral sucker. *C. contorti* n.sp. from *Anisus contortus* resembles *Apharyngostrigea* in the shape of the excretory system but has seven pairs of penetration glands. *C. valvatae* n.sp. from *Valvata piscinalis* differs from other cercariae of *Diplostomum* in the nature of the cuticular armature and the presence of unpigmented eyespots and of nine pairs of hairs on the tail trunk. *C. abyssalis* n.sp. from *V. piscinalis* differs from other diplostomid cercariae with two pairs of glands behind the ventral sucker in the presence of unpigmented eyespots, the nature of the cuticular armature and in that the glands of the first pair are elongated and extend in front of the ventral sucker. Six new xiphidiocercariae are described from *L. stagnalis* and the seventh from *Radix pereger*. *Xiphidiocercaria I* n.sp. most closely resembles *C. goodmani* but is larger and has eight pairs of penetration glands which take up one third of the body length. Other related species are *C. micropharynx*, *C. glandulosa* and *C. diaphana*. *Xiphidiocercaria II* n.sp. in contrast to *Xiphidiocercaria I*, is positively geotactic. *Xiphidiocercaria III* n.sp. differs from the cercariae of *Haplometra cylindracea* in the shape of the rudimentary gut and in that the penetration glands on each side are in a close group, from *C. helvetica XI* in being larger (body 0·27 to 0·33 mm., tail 0·236 mm.) and from *Lecithodendrium chilostomum* in the position of intestinal branches and the shape of the bladder. *Xiphidiocercaria IV* n.sp. differs from *I* in having six pairs of penetration glands. *Xiphidiocercaria V* n.sp. resembles *III* but differs in the tandem arrangement of the penetration glands, a characteristic feature of *H. cylindracea*; in this new species, however, the intestine branches anterior to the ventral sucker. *Xiphidiocercaria VI* n.sp. is 0·36 to 0·39 mm. long and therefore larger than the related *C. micropharynx* while its stylet is shorter. *Xiphidiocercaria VII* n.sp. differs from *C. pulicis* with a similar gut, in the presence of the pigmented eyespot and rather large cystogenous cells. Sporocysts containing germ balls, cercariae and metacercariae of *Cercariaeum pereger* n.sp. were found in *R. pereger*. This species has a characteristic structure unlike that of other known species of *Cercariaeum*. Several new records for the U.S.S.R. and new host records are made. G.I.P.

(219e) Forty species of trematodes, 43 of cestodes, 19 of nematodes, six of acanthocephalans and one leech (*Protoclepsis tesselata*) are listed amongst the parasites recorded from 105 wild and domestic birds collected in the vicinity of small lakes on a poultry farm in the Kaliningrad region. They include *Echinocotyle paranitidulans* n.sp., from the intestine of *Calidris alpina*, which is characterized by the long genital bursa reaching to the aporal side of the segment, the spiral arrangement of the musculature in the bursal wall and the length of the rostellar hooks (0·040 to 0·042 mm.). Additional morphological data are given for the following insufficiently described species: *Echinoparyphium* sp. No. 3 Oshmarin, 1956, *Hymenolepis capillaroides*, *Aploparaxis larina*, *Anomotaenia discoidea* and *Monilifer spinulosa*. A number of new host records are made and three species are new for the U.S.S.R. G.I.P.

(219f) The acanthocephalan larvae found in crustaceans from several lakes in Karelia were *Pseudoechinorhynchus clavula* in *Pallasea quadrispinosa* (this is a new host record), *Metechinorhynchus salmonis* in *Pontoporeia affinis*, *Acanthocephalus lucii* and one larva of *A. anguillae* in *Asellus aquaticus*, and unidentified larvae of *Polymorphus*, probably *P. magnus*, in *Gammarus pulex*. *Mysis oculata* and species of Ostracoda were not infected. The infections depended on the age of the host and showed a seasonal variation. G.I.P.

220—SYMES, C. B., 1959.—"Observations on the natural history of human filariasis in Fiji. A report to the Secretary of State for the Colonies on investigations conducted over the period 1954–1956." London: Colonial Office, 126 pp. [Mimeographed.]

Following a brief discussion of the population and climatology of the Fiji Islands, Symes presents data on the feeding habits, breeding, distribution and relative prevalence of some of the 16 species of mosquitoes found during his survey of the islands conducted during 1954 to 1956. *Aedes fijiensis*, *A. polynesiensis*, *A. pseudoscutellaris* and *Culex fatigans* were found naturally infected with the Pacific form of *Wuchereria bancrofti*. Laboratory studies indicate that whereas the three first-named species show approximately equal potentiality as vectors of filariasis, *C. fatigans* shows a lower potentiality. *A. aegypti*, *A. vexans*, *C. annulirostris* and *C. sitiens* would not support the development of filariae in the laboratory. The author considers the incidence of filarial infection in the small populations sampled to be about 30% and the incidence of clinical filariasis to be about 5% but points out the inadequacies of the techniques used in the survey. Brief notes are given on the morphological differentiation of, and on the different environments within the vectors of, the human filaria (*W. bancrofti*), the dog filaria (*Dirofilaria immitis*) and of the filaria [not named] of the fruit-bat, *Pteropus hawaiiensis*. There are 82 tables of data. [There is a note to the effect that all the photographic plates referred to in the text of this work have been omitted.] J.W.S.

221—UNITED STATES DEPARTMENT OF AGRICULTURE, 1959.—"Index-catalogue of medical and veterinary zoology. Supplement 9. Authors: A to Z." Washington, D.C.: U.S. Government Printing Office, 322 pp.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp.

a. HALAWANI, A., 1959.—"Report on schistosomiasis: (a) Bilharziasis in Africa and Egypt." pp. 9–11.

b. BARBOSA, F. S., 1959.—"Report on schistosomiasis: (b) Schistosomiasis mansoni in the Americas; some aspects of the problem." pp. 12–16.

(222b) Barbosa discusses some recent work, citing 17 references, on schistosomiasis, with particular reference to the ecology of the snail vectors and the confusion regarding their taxonomy. H.H.W.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

c. HUBENDICK, B., 1959.—"On the family Ancylidae with special regard to *Ferrissia tenuis* (Bourguignat), the suspected intermediate host of *Schistosoma haematobium* in India." pp. 17–21.
d. OLIVIER, L. & BARBOSA, F. S., 1959.—"Survival and weight loss of *Australorbis glabratus* kept at controlled relative humidities in the laboratory." pp. 22–37.
e. WRIGHT, C. A., 1959.—"Some new approaches in malacology." pp. 38–42.
f. ABDEL MALEK, E., 1959.—"Natural and experimental infection of some bulinid snails in the Sudan with *Schistosoma haematobium*." pp. 43–52.
g. AUGUSTINE, D. L., 1959.—"Studies on the biology and control of schistosome-bearing snails." pp. 53–57.
h. HSÜ, H. F. & HSÜ, S. Y. LI, 1959.—"Characteristics of geographic strains of *Schistosoma japonicum* in the final hosts." pp. 58–66.
i. STIREWALT, M. A., 1959.—"Relation of skin reaction to penetration and to the development of local resistance to entry by challenging cercariae of *Schistosoma mansoni*." pp. 67–76.

(222c) As the observations of Gadgil & Shah in 1955 [for abstract see Helm. Abs., **24**, No. 383b] on the fresh-water limpet, *Ferrissia tenuis*, transmitting *S. haematobium* in Bombay has focussed much interest on this ancylid snail, Hubendick gives an illustrated account of its anatomy. H.H.W.

(222d) Specimens of *Australobis glabratus* collected from three localities near Recife, Pernambuco, survived out of water for long periods even at low relative humidities while those collected in Salvador, Bahia, lost weight and died much more rapidly when kept under identical laboratory conditions. R.T.L.

(222f) In the Sudan *Bulinus truncatus* is apparently the chief vector of *Schistosoma haematobium*. No natural infections were found in *B.* (*Physopsis*) *ugandae* although there was experimental and epidemiological evidence that it can transmit this schistosome; two specimens naturally infected with *S. bovis* were collected. No natural infections were found in *B. forskalii* although specimens were infected experimentally and shed a few cercariae for a short period. R.T.L.

(222g) Augustine briefly summarizes laboratory experiments designed to gain information on the control of schistosome-bearing mollusca by biological means, possibly by bacterial pathogens and predators, by the voracious herbivore, *Marisa cornuarietis*, and by the inhibiting effects of streptomycin on reproduction and of inorganic ions (particularly calcium ions) on the hatching of mollusc eggs. So far very few answers have been obtained to the many questions raised by these experiments. R.T.L.

(222h) The existence of four geographical strains of *Schistosoma japonicum* is now well established but further studies on their pathogenesis have still to be made. R.T.L.

(222i) Stirewalt discusses in detail previous work [for abstract see Helm. Abs., **22**, No. 166a] on the influence of a previous infection of mice with *Schistosoma mansoni* on a challenging infection with the same species. The additional information now given includes the results of a detailed histological examination of penetrated mouse skin, biopsied at intervals, after exposure of from five minutes to ten days. After penetration by the cercariae a thickening of the stratum corneum was seen and it is concluded that this was responsible for the observed reduction in numbers of the challenging cercariae being able to penetrate. H.H.W.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

j. EVANS, A. S., 1959.—"Some biophysical properties of an isolated CHR and cercarial agglutinating factor from human anti-serum to schistosomiasis mansoni." pp. 77–88.
k. RODRIGUES DA SILVA, J., 1959.—"Avaliação dos resultados da terapêutica específica da esquistossomose mansoni em uma campanha de saúde pública no Brasil. O valor das diferentes drogas e esquemas." pp. 89–100.
l. MOUSA, A. H., 1959.—"Clinico-pathological, hoemodynamic [haemodynamic] studies and management of hepato-splenic schistosomiasis in Egypt." pp. 101–108.
m. OLIVER-GONZÁLEZ, J., 1959.—"The circumoval test in the diagnosis of infections with *Schistosoma mansoni*." pp. 109–110.
n. PRATES, M., 1959.—"Bilharzia—some pathological aspects." pp. 111–114.

(222j) The difficulties encountered in previous work [for abstract see Helm. Abs., **24**, No. 229d] on the pericercarial envelope (CHR) and the cercarial agglutinating factor of *Schistosoma mansoni* are discussed. The development of a continuous flow electrochromatography apparatus enabled the author to overcome these difficulties. The apparatus was used to fractionate the sera of untreated human cases of schistosomiasis. Six major components and a total of 28 subfractions were recovered and each subfraction was tested *in vitro* for its active principle in terms of the CHR and cercarial agglutinating activity; the two were found to be localized to a single subfraction. The physical and chemical properties of the active principle are described. Qualitative ultracentrifugal analysis, however, revealed the fraction to be polydisperse, having two minor, comparatively fast-moving fractions with sedimentation rates of 11·9 and 7·7 Svedberg units respectively and a major, slow-moving component with a sedimentation constant of 5·1 Svedbergs. CHR and cercarial agglutinating activity were isolated in the major component. Evans states that chromatographic analysis of the acid hydrolysates of the active subfraction revealed that the amino-acid composition was different from that "assigned to the so-called normal human gamma-globulins by Brand & Edsall (1947)" [see *Annu. Rev. biochem.*, **16**, p. 223]. H.H.W.

(222k) The author reports the effects on patients with *Schistosoma mansoni* of three antimony drugs called APDS (sodium pyrocatechol antimony disulphonate), ADSP (potassium antimony dimercaptosuccinate) and GTAS (trivalent sodium antimony gluconate). About 30% of 494 persons given APDS, 49% of 123 given ADSP, and 37% of 165 given GTAS reacted adversely to the drugs. Manifestations of intolerance in 900 patients are listed, the commonest reaction being nausea and/or vomiting. There was much variation in intolerance according to the locality from which infected persons came. For example, 42·3 to 68·6% of patients from Paraiba reacted adversely to the three drugs as compared to 9·1 to 27·7% from R.G. do Norte (Touros). The authors suggest, therefore, that it is necessary to adopt a regime of treatment which takes into account local differences in tolerance to the drugs. There was a rise with age in the incidence of intolerance to all three drugs. For example, only about 12% of people 3 to 15 years of age reacted adversely to APDS as contrasted with 62% in the 21 to 30 age group. Treatment, regardless of which of the three drugs was used, was successful in over 80% of the individuals treated although less successful in children than in the older age groups. R.C.A.

(222m) When the eggs of *Schistosoma mansoni* are incubated in serum from humans infected with the trematode, a circumoval precipitate is formed. In a brief account of the circumoval test in the diagnosis of *S. mansoni*, Oliver-González states that it requires the use of viable eggs, that it does not give quantitative results and that serum titres cannot be determined. H.H.W.

(222n) Prates briefly reports the chief pathological conditions associated with *Schistosoma haematobium* infection in Mozambique. R.T.L.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

o. WARREN, K. S. & DEWITT, W. B., 1959.—"Esophageal varices in mice infected with *Schistosoma mansoni*." pp. 115–119.
p. WELLER, T. H. & CHEEVER, A. W., 1959.—"Further studies on the growth of *Schistosoma mansoni* in vitro." pp. 120–125.
q. PERLOWAGORA-SZUMLEWICZ, A., 1959.—"Studies on the biology of *Australorbis glabratus*, schistosome-bearing Brasilian snail." pp. 126–167.
r. BUTTNER, A., 1959.—"La bilharziose en Mauritanie. Influence de l'économie traditionnelle sur le cycle épidémiologique et sur la résistance à l'infestation." pp. 168–176.
s. ANDRADE, R. M. DE & FREITAS, J. R. DE, 1959.—"Observações ecológicas sobre o *Australorbis glabratus* em Belo Horizonte (Minas Gerais), Brasil: I. Densidade e vitalidade." [Abstract.] pp. 181–182.
t. MORAIS, T. DE, 1959.—"Sobre um inquérito parasitológico aos colonos europeus estabelecidos no esquema de irrigação do vale do Rio Limpopo." pp. 183–193.
u. FRIEDHEIM, E. A. H., 1959.—"The treatment of urinary bilharziasis with antimony dimercaptosuccinate (TWSb)." pp. 194–196.
v. GÖNNERT, R. & SCHRAUFSTÄTTER, E., 1959.—"A new molluscicide: molluscicide Bayer 73." pp. 197–202.

(222p) [The full account of this work appears in *Amer. J. Hyg.*, **68** (3), 322–339; for abstract see Helm. Abs., **27**, No. 185a.]

(222s) Data collected in the field from November, 1955 to April, 1957 showed that in an area of about 2,000 metres in extent in Represa da Pampulha (Brazil), only 1% was suitable for maintaining populations of *Australorbis glabratus* in equilibrium. Although its habitat is restricted, the snail is able to disperse itself markedly. R.C.A.

(222t) The author investigated the parasites of 558 European colonists, six months to 75 years of age, inhabiting an irrigation district near Guija in the Gaza district of Mozambique. Infections with helminths were as follows: schistosomiasis 2·86%, *Ascaris* 5·73%, hookworm 0·17%, pinworm 3·04%, tapeworm 0·17%, whipworm 5·91%. The incidence of parasitism according to age and sex is given in tables. R.C.A.

(222u) Friedheim from a study of reports on 323 clinical cases, published and unpublished, on the treatment of *Schistosoma haematobium* in Egypt, Israel, Morocco and Southern Rhodesia, concludes that antimony dimercaptosuccinate (TWSb) administered either intramuscularly or intravenously for two to ten days is a well-tolerated therapy producing over 90% cures. The useful single dose for adults is from 0·3 gm. to 0·5 gm. and the total dose ranges from 2 gm. to 2·5 gm. The toxic effects are much milder than those from tartar emetic and are of no significance because of the shortness of the course of treatment and their rapid subsidence when the drug is stopped. R.T.L.

(222v) The molluscicide Bayer 73 is ten times superior to copper sulphate, pentachlorophenol and dinitro-*o*-cyclohexylphenol. It does not irritate the skin or mucous membranes, is lower than PCP in toxicity to fishes and plants are not affected by concentrations exceeding those required for the destruction of molluscs; its toxicity to warm-blooded animals is remarkably slight. R.T.L.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

w. WATSON, J. M., 1959.—"Schistosomiasis in the Tigris-Euphrates Valley, with special reference to its economic consequences." pp. 203–210.

x. NAJARIAN, H. H. & THOMPSON, P. E., 1959.—"Drug evaluation in experimental *Schistosoma mansoni* infections of rhesus monkeys." pp. 211–215.

y. SOARES, R. DE R. L. & GONÇALVES, N. B., 1959.—"Acção do ricinoleato de cobre e de outros planorbicidas sobre as cercárias do *Schistosoma mansoni*." pp. 216–219.

z. FRAGA DE AZEVEDO, J., BRAGANÇA GIL, F., CARVÃO GOMES, F. & CARVALHO BARREIRA, F., 1959.—"Estudo do metabolismo em moluscos de água doce: IV. Absorção do cálcio pelo *Australorbis glabratus*, estudada com o uso do ^{45}Ca." pp. 220–241.

ba. SANCHES, W. R. R., 1959.—"A remoção de dejectos e o abastecimento de água no contrôle da esquistossomose." pp. 242–257.

bb. MACY, R. W., 1959.—"On the distribution and biology of dermatitis-producing schistosomes in western North America." pp. 258–264.

(222w) In Iraq the major focus of *Schistosoma haematobium* infection in the valley of the Tigris and Euphrates rivers is in the central and southern provinces where its incidence is just over 25% regardless of age, sex or place of origin. The infection is a social rather than an occupational problem, the incidence falling as financial status rises. Schistosome dermatitis is wide-spread in southern Iraq. Cattle, sheep and goats in the lower part of the valley are frequently infected with *S. bovis* and *Ornithobilharzia turkistanicum*. The lowering of individual energy and working capacity results in a marked reduction of agricultural output and infected persons suffer loss of income through absence from work while the community and individuals sustain further losses through the time occupied by treatment and its cost. Watson states that the infection is not found further south than Basrah owing to the periodical incursion of salt water from the Persian Gulf during high tides which destroys the vectors. (But in the subsequent discussion Azzawi claims that the salinity of the water does not explain the absence of human infections south of Basrah. If the absence of *Bulinus truncatus* is confirmed a more extensive survey may reveal another vector or that the human infection is due to *S. bovis*.) R.T.L.

(222x) It is suggested that albino mice may not be suitable experimental animals for evaluating anthelmintics and that rhesus monkeys are better for their evaluation in *Schistosoma mansoni* infections. Percutaneous exposure of the monkeys to 1,000 cercariae for about 45 minutes resulted in 750 worms reaching maturity. When the animals were positive for eggs they were treated with a drug twice daily, five days a week, for one to four weeks. The faeces were then examined twice weekly by the acid-ether method and by hatching experiments, if the former was negative. After six consecutive negatives the monkeys were killed and examined. It was found that with miracil-D, using nine monkeys, a single dose of 100 mg. per kg. body-weight was ineffective but doses of 25, 50, 100 or 200 mg. per kg. given twice daily for five, ten or 20 days were moderately effective. H.H.W.

(222y) The authors studied the effects of various molluscicides on the cercariae of *Schistosoma mansoni*. In relation to dilutions necessary to immobilize cercariae in four minutes, sodium ricinoleate mixed with copper ricinoleate was most effective followed by copper sulphate, Paris green and copper ricinoleate (the two last-named were equally effective). In relation to the dilutions necessary to produce death of cercariae in 14 minutes, sodium ricinoleate in copper ricinoleate was again most effective, followed by Paris green and copper sulphate. R.C.A.

(222ba) The author outlines, with careful drawings, the type of private and public lavatories that would be suitable in Brazil for the prevention of the spread of schistosomiasis. R.C.A.

(222bb) From a survey of the literature it is clear that schistosome dermatitis due to a number of species, fresh-water and marine, is very widely distributed in western North America from Mexico to central Alaska but much remains to be ascertained regarding the taxonomy, life-history and epidemiology of the species concerned. R.T.L.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

bc. KERSHAW, W. E., 1959.—"Pathogenesis of eye-lesions in onchocerciasis." pp. 270–278.
bd. DÍAZ, F., 1959.—"Transmisión de la oncocercosis." pp. 279–286.
be. AGUILAR, F. J., 1959.—"Enfermedad de Robles (estado actual de la oncocercosis en Guatemala)." pp. 287–298.
bf. MILLER, M. J. & GUNDERS, A. E., 1959.—"Studies on onchocerciasis in Liberia." pp. 299–304.
bg. LEWIS, D. J., 1959.—"Some aspects of the study of *Simulium damnosum*." pp. 305–314.
bh. DUKE, B. O., 1959.—"Preliminary results of a trial of antimony dimercaptosuccinate or 'TWSb' (Friedheim) against infection with *Onchocerca volvulus*." pp. 315–319.
bi. CROSSKEY, R. W., 1959.—"Observations relating to the insecticidal control of *Simulium damnosum* Théobald." pp. 320–323.

(222bc) [An account of this work appears in *Trans. R. Soc. trop. Med. Hyg.*, **52**, 122–127; for abstract see Helm. Abs., **27**, No. 64t.]

(222bd) Díaz discusses the problem of onchocerciasis in Central America with special reference to work done there on transmission, pathology and control. R.C.A.

(222be) Aguilar outlines the history of studies of *Onchocerca volvulus* in Guatemala, the present geographical distribution and incidence of the infection there, as well as control measures undertaken. He discusses briefly the epidemiology of onchocerciasis and lists the simuliids reported from Guatemala, three of which (*Simulium callidum*, *S. metallicum* and *S. ochraceum*) are considered to be the main vectors. The endemic zone covers some 1,800 square kilometres in which 21·5% of the 61,241 inhabitants are estimated to be infected. R.C.A.

(222bf) Onchocerciasis is prevalent in Liberia and infected individuals with a relatively high microfilarial content on the skin are not uncommon, but no cases of blindness are known to exist and no eye lesions were seen in 184 patients, although 80 showed microfilariae in the skin at the outer canthus. In eight of these conjunctival biopsies from the bulbar conjunctiva were positive but none showed any microfilariae in the eyes on examination with the corneal microscope. R.T.L.

(222bg) This account of *Simulium damnosum*, the vector of *Onchocerca*, includes a discussion of its distribution, the prevalence of larvae and pupae during the apparent scarcity of adults, the difficulties of finding the early stages where adults are abundant, unusual breeding places, the nulliparous and parous components of a population of flies, differences between individuals, time of biting and survival during the unfavourable season. Lewis also discusses briefly the number of infective *Onchocerca* in individual flies, the infection rate and the occurrence of the vector in the absence of onchocerciasis. H.H.W.

(222bh) Duke confirms that TWSb is both microfilaricidal and capable of destroying unhatched embryos in adult female *Onchocerca volvulus*. Ten cases of onchocerciasis which were treated with 2·4 to 2·8 gm. of TWSb were followed up for one year. The level of drug concentration which brought about complete eradication of the parasites over this period led to severe reactions but the results were sufficiently encouraging to warrant the search for other closely related but less toxic compounds. R.T.L.

(222bi) Crosskey emphasizes that the insecticidal control of *Simulium damnosum* has mostly been applied with limited knowledge of the insect, very little being known of its detailed behaviour and how this varies in different parts of Africa. He states that we know "next to nothing of the male sex" and discusses other inadequacies in our knowledge of the vector. H.H.W.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

bj. KESSEL, J. F., LAIGRET, J., MARCH, H. N., BAMBRIDGE, B. & CHAPMAN, H., 1959.—"Epidemiology and control of filariasis with special reference to French Polynesia." pp. 326–338.

bk. IYENGAR, M. O. T., 1959.—"A brief review of the epidemiology of filariasis in the South Pacific." pp. 339–343.

bl. WILSON, T., 1959.—"Filariasis in Malaya." pp. 344–360.

bm. LIE KIAN JOE & REES, D. M., 1959.—"Filariasis in Indonesia: distribution, incidence and vectors." pp. 361–370.

(222bj) Filariasis is discussed with particular reference to its occurrence in French Polynesia where the following results were obtained from an extensive research programme. Non-periodic *Wuchereria bancrofti* was found to cause elephantiasis in 14% and lymphangitis in 27% of the adults, while hydrocele occurred in 16% of the males. Many potential insect vectors occurred in the region but *Aedes polynesiensis* was the only species with a high rate of natural infection. The control of the insect vectors alone was found to be inadequate but when combined with the mass administration of diethylcarbamazine over a period of three years, microfilaraemia was reduced from 32% to 3·2% and the microfilarial density in 20 cu. mm. of blood from 30 to 0·6; the number of *A. polynesiensis* harbouring infective larvae was reduced from 5% to 0·3%. 32 references on filariasis are cited. H.H.W.

(222bk) Two races of *Wuchereria bancrofti* occur in the South Pacific: a nocturnal periodic race transmitted by night-biting mosquitoes in the north and west, and a non-periodic race transmitted by day-biting mosquitoes in the east and south-west. The vectors are *Culex fatigans* in the northern zone, *Anopheles farauti* in the west, *Aedes polynesiensis* and allied species in the east and *A. vigilax* in the south-west. Four distinct zones are recognized in the South Pacific on the basis of epidemiological features. They are: (i) an area including the Micronesian islands with nocturnal periodic *W. bancrofti* transmitted by *C. fatigans*; (ii) a large part of Melanesia with nocturnal periodic *W. bancrofti* transmitted principally by *A. farauti*; (iii) Fiji and all the Polynesian islands in the eastern section of the South Pacific with non-periodic *W. bancrofti* transmitted by the *A. scutellaris* subgroup; and (iv) Loyalty Island and New Caledonia with non-periodic *W. bancrofti* transmitted by *A. vigilax*. The variation in the extent of filariasis in these zones is correlated with the density of each vector in relation to the distribution of the populated areas rather than to any difference in the pathogenicity of each race of *W. bancrofti*. H.H.W.

(222bl) Filariasis in Malaya is mainly due to the following two strains of *Wuchereria malayi*: (i) the Kedah/Penang strain with nocturnal periodicity and associated with coastal rice fields; the vectors are of the *Anopheles hyrcanus* group and *A. barbirostris*, *Mansonia indiana*, *M. uniformis* and *M. annulifera* (the animal reservoir host is unknown but it was transmitted experimentally to cats); (ii) the Pahang strain with little nocturnal periodicity and associated with fresh-water swamp forests; the vectors are *M. longipalpis*, *M. annulatus* and *M. uniformis*, the anophelines being unimportant. Cats and monkeys act as reservoir hosts. It was found that diethylcarbamazine is an effective treatment of *W. malayi* which causes elephantiasis of the legs. H.H.W.

(222bm) A map of the area, three detailed tables and 48 references are given in this summary of filariasis in Indonesia. The main conclusions are that *Wuchereria malayi* and periodic *W. bancrofti* are widely distributed in Indonesia with a relatively high incidence in man but frequently without visible clinical symptoms. It is commonly associated with elephantiasis and hydrocele in West Irian and on the island of Buruh, but elephantiasis rarely appears with *W. bancrofti* in Djakarta and Sumba although hydrocele is common. The important mosquito vectors of filariasis in Indonesia are *Mansonia annulata*, *M. annulifera*, *M. longipalpis*, *M. uniformis* and *Anopheles barbirostris* for *W. malayi*; for *W. bancrofti*, *Culex fatigans* is an important vector in Djakarta but not in eastern Indonesia while *A. farauti*, *A. punctulatus*, the *Aedes kochi* group and *C. bitaeniorhynchus* are important in West Irian. H.H.W.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

bn. JORDAN, P., 1959.—"Epidemiology and control of bancroftian filariasis in Africa, with particular reference to Tanganyika." pp. 371–381.
bo. BUCKLEY, J. J. C., 1959.—"A new genus, *Brugia*, for *Wuchereria* spp. of the *malayi* group." pp. 384–391.
bp. HAWKING, F., 1959.—"Chemotherapy of filariasis: periodicity of microfilariae." pp. 394–400.
bq. SCOTT, J. A., 1959.—"Studies on immunity to the filarial worm of cotton rats." pp. 401–408.
br. MINNING, W., 1959.—"Serological investigations with *Loa loa* antigens." pp. 409–411.

(222bn) Jordan states that differences in geography, climate, mode of life of the different peoples and numerous other factors account for the differences in the data available on bancroftian filariasis in Africa. He, therefore, describes in detail various aspects of the disease in Tanganyika but refers, where appropriate, to reports of the disease from other territories on the continent. Reasons which suggest a relative immunity to the disease in some people are given. They are the rarity of a 100% infection in cases where infected mosquitoes are abundant, the different infection rates in males and females, a higher incidence of infection in persons with blood group A and a higher incidence of mixed infection than would occur by chance in areas where *Wuchereria malayi* and *W. bancrofti* co-exist or where *W. bancrofti* and *Acanthocheilonema perstans* occur together. The higher incidence of infection in males, in older age groups and in certain families is discussed and the occurrence of areas where non-bancroftian elephantiasis is common. A renewed search in East Africa for an animal reservoir host of *W. bancrofti* was unsuccessful. The disease is transmitted mainly by *Anopheles gambiae*, *A. funestus*, *A. costalis* and *Culex fatigans*. It is suggested that the control of the vectors by insecticides and the effective eradication with diethylcarbamazine is not at present practicable on a large scale. 55 references are cited. H.H.W.

(222bo) [For abstract of the description of *Brugia* n.g. see Helm. Abs., **29**, No. 1988.]

(222bp) The effects of diethylcarbamazine and Suramin on the parasite and host in the treatment of filariasis is discussed. Of the other antifilarial compounds tested it was found that "symmetrical bis-isoquinolinium compounds of the type BIQ 20 iodide" have considerable activity against *Litomosoides* in cotton-rats. The periodicity of microfilariae is discussed with many references to published papers on its causes, passage through the capillaries and the production and destruction of the larvae in the blood stream. The author refers to a private communication with Duke who had observed that the excision of the spleen in monkeys infected with varieties of *Loa* resulted in a prolonged rise in the microfilarial count of the blood. The effect of splenectomy in dogs infected with *Dirofilaria immitis* and *D. repens* is discussed. It is thought that the spleen may be less active in destroying the microfilariae of *Dirofilaria* in dogs than those of *Loa* in monkeys. H.H.W.

(222bq) The author states that little work has been published in recent years on immunity to filariasis and discusses the information available. He points out that further experimental evidence is necessary to support any hypothesis to explain the retarded growth of the worms resulting from both natural and acquired immunity. The results obtained by infecting cotton-rats with *Litomosoides carinii* indicate that "the hypothesis based on interference with nutrition by precipitation of digestive enzymes" should either be modified or replaced by another. H.H.W.

(222br) After applying the complement fixation test, Minning compared the results obtained by using *Dirofilaria immitis* antigen and that of *Loa loa* (monkey strain) against the sera of the inhabitants of a Nigerian village where, with the exception of *L. loa*, no human filarial infection was known. It was found that the *L. loa* antigen is not species-specific but it gave more positive results. H.H.W.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

bs. SAUNDERS, D. C., 1959.—"The taxonomic separation of microfilarial species." pp. 412–417.
bt. JANSSENS, P. G., FLAMENT, F. & HELDERWEIRT, G., 1959.—"Filariose et purpura anaphylactoïde cutané." pp. 418–432.
bu. BERTRAM, D. S., 1959.—"Some factors affecting microfilarial density and pathogenicity in experimental epidemiology of an animal filarioid infection." pp. 437–443.
bv. ANDERSON, R. C., 1959.—"Possible steps in the evolution of filarial life cycles." pp. 444–449.
bw. JACHOWSKI, Jr., L. A., 1959.—"Filariasis in the Americas." pp. 450–451.
bx. VAGA, A. C., 1959.—"As filaríases em Diu." pp. 452–465.

(222bs) From a series of measurements on the microfilariae of birds it was found that as many as four "different populations or species" may occur in one host species. From this fact the author concludes that no "adult nematode, then, may safely be designated the species to which a microfilaria belongs, simply because both are found in the same individual". Many morphological variations were found in each population and are therefore considered to be of no taxonomic value. A statistical approach, similar to that used for the microfilariae of birds, is recommended for human microfilariae. H.H.W.

(222bt) The successful treatment with carbamazine of seven cases of purpura suggests that this condition may be an allergic response to some filarioids in the tissues. The seven cases, three from the same family, are described in detail. In contrast to the incidence of *Loa loa* and *Dipetalonema perstans*, purpura is extremely rare and some sylvatic filarioids (e.g. *Dirofilaria*) might have to be considered as the aetiological agent. R.C.A.

(222bu) Some experimental work on the filarioid infection of the cotton-rat, described by the author as an infection resembling *perstans*-infection of man, is discussed. Bertram states that the early development of filarioids in their vertebrate hosts should be investigated, perhaps by the marker technique [for abstract see Helm. Abs., **26**, No. 16e] for more information on the sites of development, the effects of this on the development and fecundity of the worms, the effects of frequency and amount of reinfection on worm distribution and vigour and the interaction of these three factors in producing microfilaraemia and filarial disease. H.H.W.

(222bv) Filarioids probably originated from thelaziid-like ancestors that established themselves in the tissues of the host and became completely independent of the alimentary tract during the course of evolution. An evolutionary series of increasing complexity is suggested by features of the life-cycles of *Oxyspirura mansoni*, *Thelazia rhodesii*, *Squamofilaria coronata*, *Parafilaria multipapillosa*, *Stephanofilaria* spp., *Onchocerca* spp. and *Wuchereria* spp. R.C.A.

(222bw) The author briefly discusses the lack of knowledge of human filariasis in the Americas pointing out that in some areas the most recent information on the topic is 30 years old, while in others systematic surveys to determine the extent of the disease have not been completed. H.H.W.

(222bx) In Diu 93 of 951 males and 108 of 1,044 females examined had microfilariae of *Wuchereria bancrofti* in their blood giving an over-all incidence of about 10%. The infected group is broken down according to age. Individuals between 21 and 60 years of age were more often infected than those younger or older. The incidence of various symptoms of filariasis, including mental disturbances, in the infected group are tabulated according to age and sex. 61 cases of elephantiasis were encountered, 20 in males and 41 in females; nine cases involved the arms, 48 the legs, one the scrotum, two the scrotum and leg, and one the scrotum and penis. Treatment undertaken with hetrazan and Anthisan and the results achieved are briefly discussed. R.C.A.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

by. EDESON, J. F. B. & WHARTON, R. H., 1959.—"The experimental transmission of *Wuchereria* infections from man to animals." pp. 466–471.

bz. ROOK, H. DE & DIJK, W. J. O. M. VAN, 1959.—"Changing concept of *Wuchereria bancrofti* transmission in Netherlands New Guinea." pp. 472–478.

ca. HUNTER, III, G. W., 1959.—"Skin testing for filariasis with an homologous antigen." pp. 479–483.

cb. YUTUC, L. M., 1959.—"Agglutination of microfilariae in the blood of the dog infected with *Dirofilaria immitis*." pp. 484–487.

cc. MESQUITA, J. F. F., 1959.—"Uma doença nova em Goa: a filaríase de Bancroft." pp. 488–516.

(222by) The authors point out that few attempts have been made to transmit *Wuchereria* experimentally from one vertebrate host to another and discuss published work on the transmission of *W. malayi* from man to a number of species of animals by a direct inoculation of infective larvae. Of the animals that have been successfully infected the cat was the most suitable host; in behaviour and morphology the microfilariae in the cat resembled those of the human donor and they developed normally in the vector mosquitoes. H.H.W.

(222bz) The authors emphasize, referring to previously published work, that the anopheline mosquitoes are not the only vectors of filariasis in Dutch New Guinea as infective bancroftian microfilariae have now been found in five non-anopheline mosquitoes, namely *Culex fatigans*, *C. bitaeniorhynchus*, *C. annulirostris*, *Aedes kochi* and *Mansonioides uniformis*. H.H.W.

(222ca) In view of the desirability of an accurate serological diagnosis of human filariasis, an homologous antigen of the microfilariae of *Wuchereria bancrofti* (with nocturnal periodicity) was tested on 303 people, 78 of whom were known to be non-allergic and free of helminths. 69 of the remaining 225 were known to be positive for circulating microfilariae, 106 positive for intestinal helminths, 42 were allergic and negative for helminths and eight positive for malaria. The best reaction was obtained with dilutions of 1: 8,000, 68 of the 69 people known to have filariae giving a positive result. Of the other 235 tested only four false positives were obtained. It is suggested that the test may be very specific and useful in detecting early filariasis before microfilaraemia is established. H.H.W.

(222cb) Yutuc shows that the agglutination of the microfilariae in the blood of a dog infected with *Dirofilaria immitis* is different from that observed by other helminthologists in *Schistosoma mansoni* in that it is mainly confined to the females of the host involved and is most pronounced in pregnant bitches. H.H.W.

(222cc) The author reviews extensively the history, incidence, transmission, diagnosis, treatment and control of *Wuchereria bancrofti* in Goa where it has become established within the last few decades. Eight months of the year are favourable for development of *W. bancrofti* and the reproduction of *Culex fatigans*, regarded as the principal vector. Microfilariae were found in 512 of 9,608 persons examined. Of this group 405 were Europeans (one infected) and 1,656 were Africans (111 infected) who had spent little time in Goa. Of the 7,456 native Goans examined 400 showed microfilariae, 6% of males and 4·7% of females being infected. Native Christians were about half as often infected as non-Christian natives and the highest incidence was found in the 20 to 30 age group (28% of the total infected), the incidence dropping to 8% among those over 60 years of age. The author tabulates in detail the occurrence in 241 cases of such symptoms of filariasis as lymphangitis, eosinophilia, hydrocele and elephantiasis although microfilariae were found in only eight of these. The leucocyte count was normal in eight of 100 patients studied although above 15% in a third of the patients. Complications resulting from infection were more often observed in females than males. Of the 400 individuals with microfilariae 371 received the standard treatment with hetrazan (some an incomplete treatment) and microfilariae disappeared in about 50% but persisted in variable numbers in the remainder. About 10% remained negative for about two years but a similar percentage had microfilaraemia equal to or higher than that prior to treatment. The remaining 80% had micro-

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

cd. RACHOU, R. G. & FERREIRA, M. O., 1959.—"Nota preliminar sobre o contrôle quimioterápico da filariose bancroftiana em uma localidade do Sul do Brasil." pp. 517–523.
ce. WRIGHT, W. H., 1959.—"Progress in research and control of the helminthiases other than schistosomiasis and filariasis." pp. 524–540.
cf. BONSDORFF, B. VON, 1959.—"Vitamin B_{12} deficiency in carriers of *Diphyllobothrium latum*." pp. 541–551.
cg. NEGHME, A., 1959.—"The significance of echinococcosis in the Americas." pp. 552–567.
ch. FIGUEIREDO, J. M. P. DE, 1959.—"Contribution to the study of intestinal parasitosis in Goa—some clinical and laboratorial data." pp. 568–576.
ci. SWARTZWELDER, J. C. & FRYE, W. W., 1959.—"Broad spectrum anthelmintic therapy with ditiazanine." pp. 577–582.
cj. CAMERON, T. W. M., 1959.—"Speciation in *Echinococcus* (hydatid)." [Abstract.] p. 583.
ck. JUNG, R. C. & PACHECO, G., 1959.—"The use of intradermal and indirect hemagglutination tests for the diagnosis of visceral larva migrans." pp. 586–596.

filaraemia somewhat lower than before treatment. The need for combining treatment of the infected population with eradication of mosquitoes is emphasized as well as the need to exclude individuals with microfilariae from endemic areas. R.C.A.

(222cd) In 1953, 19 of the 131 inhabitants of Ponta Grossa in the State of Santa Catarina, Brazil, had microfilariae of *Wuchereria bancrofti* in their blood. *Culex pipiens fatigans* was found in 45 houses and 10·8% of those dissected contained larval filarioids. In March, 1954, the infected inhabitants were given a seven-day treatment with hetrazan (6 mg. per kg. bodyweight each day). The population and the homes were re-examined again in June and December of 1954 and later in December of 1955–57. Although the number of mosquitoes in homes was not significantly different, the percentage of individuals with microfilariae had dropped in 1957 to 4·5% of the total population and the number of infected mosquitoes to 1·4%. R.C.A.

(222ce) The major advances in our knowledge of helminth diseases (other than schistosomiasis and filariasis) made since 1953 are briefly summarized. R.T.L.

(222cf) Sixteen references are given in a detailed discussion of vitamin B_{12} deficiency and *Diphyllobothrium latum* infections. During an investigation of this topic in eastern Finland 1,334 people were examined, 366 of whom passed the ova of the tapeworm and eight of these showed the symptoms of pernicious anaemia. The detailed results including those of haematological studies are being analysed. H.H.W.

(222cg) Neghme reviews echinococcosis and hydatidosis in North and South America citing 45 references. H.H.W.

(222ci) The authors quote many references in a discussion of the efficacy of dithiazanine against trichuriasis, ascariasis, strongyloidiasis and enterobiasis and state that it may be active against some cestodes, e.g. *Taenia* sp. and *Hymenolepis nana*. H.H.W.

(222cj) As investigations have suggested that the Canadian species of *Echinococcus* differs serologically and ecologically from that occurring elsewhere, Cameron draws attention to the need for further investigations on the speciation, immunology and comparative pathology of echinococcosis in different parts of the world. H.H.W.

(222ck) In view of the difficulties and dangers of liver biopsy in detecting visceral larva migrans in patients showing the disease syndrome which include hypereosinophilia and hepatomegaly, the authors investigated the possibilities of using immunological diagnostic methods. They state that the results from using antigens prepared from *Toxocara canis* and *Ascaris lumbricoides* have shown that intradermal testing is not likely to be of value because of the frequency of false positive reactions. The results of haemagglutination tests in larval ascarid infections in rabbits indicate that the test is specific enough to distinguish *Ascaris* and *Toxocara* larval infection in these animals but the evalution of the technique in humans was much more difficult. The difficulties are discussed and it is stated that no significant cross-reaction with *Trichuris*, *Necator* and *Strongyloides* infections was detected by the haemagglutination test. H.H.W.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

cl. RAUSCH, R., 1959.—"*Echinococcus multilocularis* infection." pp. 597–610.

cm. SADUN, E. H., 1959.—"The public health significance of paragonimiasis in the Far East." pp. 611–621.

cn. NAGATY, H. F., RIFAAT, M. A. & KHALIL, H. M., 1959.—"The in vitro ascaricidal effect of the latex of 26 species of *Ficus* as well as *Papaya carica* and *Synadenium grantii*." pp. 622–627.

co. PODYAPOLSKAYA, V., 1959.—"Epidemiologic classification of the principal human helminthiases." pp. 628–633.

cp. STANINEC, M., 1959.—"Ascariasis and chronic intestinal amebiasis." pp. 636–639.

cq. RUFFIÉ, J., MEIRA, M. T. V. DE & SOUSA, H. T. DE, 1959.—"Estudo estatístico sobre a variação da frequência da ancilostomíase com o sexo e a idade." pp. 640–645.

(222cl) Rausch discusses the controversy on the identification of *Echinococcus granulosus* and *E. multilocularis*, summarizes the information available on the host relationships and geographical distribution of *E. multilocularis* and gives an account of alveolar hydatid disease in man. In conclusion he emphasizes that further research is required on the epidemiology of alveolar hydatid so that preventive measures can be developed in order to produce an anthelmintic effective against the adult cestode in cats and dogs and in order to develop techniques for diagnosing the disease in man in its early stages. H.H.W.

(222cm) The results of over 3,000 intradermal tests for paragonimiasis, using a purified *Paragonimus westermani* antigen and carried out in different localities of Korea, are tabulated and discussed. In those areas where paragonimiasis was known to be prevalent most of the people showed a positive reaction. Some positive reactions, however, were obtained in people known to be free of *Paragonimus* but harbouring *Clonorchis sinensis*. Complement fixation tests were also very successful and specific in diagnosing paragonimiasis in a group of 162 people, 72 of whom were positive for *Paragonimus*; when applied to experimentally infected animals a positive result was obtained approximately one month later whereas eggs in the sputum could not be detected for at least two months. H.H.W.

(222cn) The authors studied the latex collected from 28 different trees, mainly species of the genus *Ficus*, for its action against "living cattle and pig *Ascaris*" collected from the Cairo abattoir, the worms being kept alive for about 48 hours in a Ringer solution at 37°C. It was found that only those saps obtained from *F. carica*, *F. pseudosychamoris* and *Papaya carica* were found effective as indicated by digestion and death of the worms. The lowest concentration that could kill and digest the worms within two hours was 0·15% of *P. carica*, 1·6% of *F. carica* and 6·5% of *F. pseudosychamoris*. H.H.W.

(222cq) Of 918 inhabitants of St. Thomas about 18·7% were infected with hookworm only, 3·5% with *Trichuris trichiura* only and 4·0% with *Ascaris lumbricoides* only. In addition, 19·1% had hookworm and *T. trichiura* together, 9·4% had hookworm with *A. lumbricoides*, 2·9% had *A. lumbricoides* with *T. trichiura*, and 21·5% were infected with all three species. Ten individuals had *Hymenolepis nana* along with one or more of the above-mentioned species. The over-all incidence of hookworm was 69·6% and it occurred in 57·6% of females and 42·4% of males examined. The incidence of hookworm was 28·4% and 36·6% respectively in female and male children under nine years but much higher in adolescents and adults up to the age of 40 (i.e. 77·1% in females and 89·5% in males). The incidence was slightly lower in individuals past 40. The individuals examined came originally from St. Vincent where hookworm does not occur endemically so they were probably infected in St. Thomas. R.C.A.

222—INTERNATIONAL CONGRESS ON TROPICAL MEDICINE AND MALARIA (6th), Lisbon, September 5–13, 1958. Proceedings, Vol. 2, 655 pp. (cont.)

cr. MIYAZAKI, I., 1959.—"Gnathostomiasis in Japan." pp. 646–649.

cs. GARCÍA, E. Y., 1959.—"Vitamin E (alpha tocopherol), a new anthelmintic against *Ascaris lumbricoides*." pp. 650–655.

(222cr) During investigations on gnathostomiasis in Japan it was found that two species of fresh-water fishes, *Ophicephalus argus* and *O. tadianus*, are the most important sources of the disease in man. An examination of 450 specimens of these two species in Fukuoka Prefecture, Kyushu, revealed that 444 harboured larval gnathostomes, the maximum number in one host being 330. *Mesocyclops leuckarti*, *Eucyclops serrulatus*, *Cyclops strenuus* and *C. vicinus* were found to be experimental first intermediate hosts. H.H.W.

(222cs) García states that, for the first time since its discovery in 1922, vitamin E is reported to be an anthelmintic. The observation is based on the results of administration of the vitamin, in the form of wheat germ oil, to 82 people known to be cases of ascariasis. H.H.W.

HELMINTHOLOGICAL ABSTRACTS
Vol. 28, Parts 1 & 2

INDEXES

	Page
Index of Authors...	166
Index of Periodicals	172
Index of Subjects	175

NOTE

In all indexes the reference is to the serial numbers and not to the pages. Numbers in **bold** type indicate abstracts, and numbers in Roman type refer to title-only entries.

In the Author Index there are no cross-references to show joint authorship, but authors of joint papers are listed individually. Thus a paper by "Brown, B., Jones, A. & Smith, J." would have three separate entries, "Brown, B.", "Jones, A.", and "Smith, J." but the serial numbers under the subsidiary authors are given in parentheses.

In the Subject Index alphabetization is under the first word (e.g. "*Acer* sp." before "*Acerina* sp."). Under the generic name of a helminth the following order is observed: papers on the genus as such; papers on undefined species; papers on new and defined species, e.g.

Capillaria
— spp.
— *aerophila*
— *amarali* n.sp.

Hosts are indexed under their scientific names, where given, except domesticated animals (e.g. cat, pig, sheep), crop plants (e.g. oats, rye, tobacco), and where numerous hosts of the same group are listed in the one paper (e.g. amphibians, birds, cereals, legumes, mammals). The use of alternative scientific names for host or parasite is avoided wherever possible but in cases in which nomenclatorial or taxonomic confusion still exists the same organism may appear under more than one name.

Anthelmintics are listed alphabetically under that word, either by their trade name or by the active principle. There are no cross-references between proprietary drugs having the same or similar constituents and no classification of the drugs is attempted. They are also entered under the name of the parasite or disease and under the name of the host. For eelworms parasitic in or on plants they are entered alphabetically under *Nematicides* (*plant eelworm*) and under the name of the eelworm.

INDEX OF AUTHORS

(The reference is to the serial number. Numbers in **bold** type indicate abstracts; numbers in parentheses indicate subsidiary authors in cases of joint authorship.)

Anon., **19b,** 32a, **44b, 72c, 72g, 74a.**
Abdallah, A., **141a, 141c,** (**141e**).
Abdel Mageed, S. M., (**142a**).
Abdel Malek, E., **222f.**
Acharya, P. T., (**132a**).
Adhya, R. N., (115a).
Agarwal, S. M., **23a.**
Agosin, M., **36b.**
Aguilar, F. J., **222be.**
Ahluwalia, S. S., (**135a**).
Ahmed, Z., **76d.**
Ahsan, S. N., **33a.**
Akane, S., (**114a**).
Akhmerov, A. K., **203g, 203h.**
Akopyan, V. D., (**203t**).
Akramovski, M. N., **203b.**
Alavi, A., (**97a**).
Aliev, A. A., **69a.**
Allain, D. S., (**7e**), (**7f**), (**144a**).
Allan, D., **20a.**
Allen, R. M., (**49n**).
Almeida Gomes, J., (**88g**).
Altaev, A. K., **203c, 203d.**
Alves, W., **121b.**
Amato Neto, V., (**131b**).
Ameel, D. J., (**197a**).
Andersen, S., **43o.**
Anderson, R. C., **10b,** (**10c**), (**10d**), **111a, 222bv.**
Andrade, R. M. de, **222s.**
Anikina, V. V., **203e.**
Araújo Bastos, W. D. de, **109a.**
Araullo, T. P., (**165a**).
Aravena, L. C., (**36b**).
Armour, J., (**72b**).
Arnold, T. F., **72a.**
Arroyo Sancho, G., (**182a**).
Artyukovski, A. K., (**79g**).
Asadov, S. M., **29a, 203f.**
Assen, H. von der, **199b.**
Atkins, J. G., (**48e**), **48f,** (**49c**).
Augustine, D. L., **7j, 222g.**
Aycock, R., **48a.**

Ba, A., **116c.**
Baić, S., (**18e**).
Bain, D. C., **49q.**
Baker, A. D., **26a.**
Baker, N. F., (**8d**).
Balozet, L., **98a.**
Bambauer, H., **199c.**
Bambridge, B., (**222bj**).
Bandyopadhyay, A. K., (115b).
Baranovskaya, I., **130a.**
Barbosa, F. S., **222b,** (**222d**).
Barciszewski, M., 166a.
Barker, K. R., **48g.**
Barron, E. S. G., (**106a**).
Basnuevo, J. G., 186b, 186c, 186e, 186f, 186g, 186h.
Bašta, J., (96b).
Bauman, P. M., (**71a**).
Baxter, J. T., **72m.**
Belobrad, G., (**194b**).
Belokurskaya, V. I., 213f.
Belopolskaya, M. M., **219a, 219b.**
Belyaeva, I. V., **203i.**
Belyaeva, M. Y., **206 l,** (**206s**).
Benvenuti, O., (**184a**).
Berecký, I., **128d.**
Berg, J. A. ten, **160b.**
Bernal-Rosa, J. F., (**139a**).
Bertram, D. S., **222bu.**
Bessonov, A. S., **130s, 206x.**
Bezubik, B., **1h.**
Bhaduri, N. V., 115b, 115c.
Biagi F., F., **52b.**
Bichikhin, M. T., (**69f**).
Biester, H. E., (**40f**).
Bikhovskaya-Pavlovskaya, I. E., **203 l.**
Bikhovski, B. E., **79d.**
Birchfield, W., **49d.**
Bird, A. F., **43e.**
Birová-Volosinovičová, V., **130b.**
Bishaeva, L., (**130x**).
Black, H., (**86a**).
Blackburn, M., (161a).
Blake, C. D., **53a.**
Blondeau, R., (**62a**).
Blumenfeld, N., (**108a**).
Boch, J., (**18b**), **18c, 51a.**
Bogdanovich, V. V., (**203r**).
Bogitsh, B. J., **148a.**
Bogoyavlenski, Y. K., **130bg,** (**203cn**).
Bolkhovitinov, D. Z., **203j.**
Bono, G. del, 93a, **93d, 215b.**
Bonsdorff, B. von, **222cf.**
Boock, O. J., **112a.**
Borchert, A., 29a.
Borgarenko, L. F., (**130f**), **196a.**
Borges Hernández, F., 186d.
Borowska-Kuźmicka, J., (**166b**).
Bradbury, S., **177a.**
Bragança Gil, F., (222z).
Brandt, M. C., (**71b**).
Bravo-Hollis, M., (**89b**), **89d.**
Bremner, K. C., **16a.**
Brenes, R. R., (**89d**), **182a.**
Breza, M., **128b,** 130bp, **194b.**
Brglez, J., (**70b**).
Brooks, jr., T. J., 99a.
Bruskin, B. R., (**130v**), (**130bj**).
Brygoo, E. R., (**10d**).
Buck, A. A., (**5a**).
Buckley, J. J. C., (**13f**), 222bo.
Buliginskaya, M. A., **203k.**
Burke, J. C., (**5a**).
Burton, G. J., **133a.**
Bussiéras, J., (**118a**).
Buttner, A., **222r.**

Caballero y C., E., **89a, 89b.**
Cabalteja, E. F., (**165a**).
Cabrera, B. D., (**165a**).
Callender, M. E., (**71b**).
Camain, R., (116c).
Cameron, T. W. M., **222cj.**
Campbell, J. A., (**47a**).
Campos, M. S. de, (**184a**), **184b.**
Campos, R., **131b,** (**184b**).
Carayon, A., 116a.
Carvalho, J. C., **107a.**
Carvalho, R. G. de, **88h.**
Carvalho Barreira, F., (222z).
Carvão Gomes, F., (**88a**), (222z).
Castro Salazar, J. M., (**88b**), (**88c**).
Cesnik, R., **180b.**
Chabaud, A. G., (**10b**), **10c, 10d.**
Chakravarti, R. N., 115a.
Chanishvili, I. V., **203cy.**
Chao, Y. C., (**30e**).
Chapman, H., (**222bj**).
Chapman, R. A., **48p.**
Chappell, A. C., 50a.
Cheever, A. W., (222p).
Chen, C. L., (**30e**).
Cheng, T. C., **9a,** (**148a**).
Chernikova, M. S., **203cz.**
Chertkova, A. N., (196c), (**206u**), **206w.**
Chhuttani, P. N., 140b.
Chi, J. C., (**30d**).
Chia, C. F., **30b.**
Choizho, U., **203cw.**
Chowaniec, W., **1f.**
Chugh, K. S., (140b).
Chyu, I., (**117a**).
Cieleszky, V., **84j.**
Colbran, R. C., **178a.**
Collis-George, N., **127c.**
Collomb, H., (116a).
Coninck, L. A. P. de, (**102a**).
Cooper, T. V., (**19a**).
Cooper, W. E., **48h.**
Cordero, R., 110f.
Corkum, K. C., **171a.**
Correa, P., (116b).
Corsalini, T., **211a.**
Costa Mourão, M., (**88b**), (**88c**).
Costello, L. C., **36 i.**
Cotten, J., **42a.**
Cowperthwaite, W. G., (**49d**).
Crittenden, H. W., **35d.**

Crosskey, M. E., (13b).
Crosskey, R. W., 13b, 117b, 222bi.

D'Abrera, V. St. E., 168a.
Dadiotou, D. D., (82a).
Damanskaya, L. Y., 203u, 213m.
Danaraj, T. J., 7k.
Danilin, V. F., 203v.
Darling, H. M., 49i.
Da Silva, L. S., (7k).
Davidova, I., 130c.
Davtyan, E. A., 203t.
Dawes, B., 42i.
Delgado Flores, E., (182a).
Delyanova, R. S., 206m.
Demidov, N. V., 203w, 206z, 206ba, 206bb, 206bc, 206bd, 206bj.
Deripasko, P. G., (206bd).
Desprez, P., 154c.
Deubert, K. H., 78a.
DeWitt, W. B., (222o).
Díaz, F., 222bd.
Díaz-Bonnet, L. A., (139a).
Díaz-Ungría, C., (111a).
Dickinson, S., 43h.
Dickson, W., 15a.
Dijk, W. J. O. M. van, (222bz).
Dirksen, G., 34b.
Diwan Chand, (133d), 133e.
Dobeš, M., 60b.
Dolnikov, Y. Y., 130be.
Donà dalle Rose, A., 85a, 85b.
Dorsman, W., 67b.
Dougherty, E. C., 198v.
Douglas, J. R., 8d.
Douglas, L. T., (36g).
Dożańska, W., 1b.
Drechsler, C., 159a.
Drombrovski, A. A., 195d.
Dropkin, V. H., 48b, (49o).
Dróżdż, J., (1f).
Drudge, J. H., 8b.
Dubinina, M. N., 79e.
Dubnitski, A. A., (130z), (206h).
DuCharme, E. P., 48q.
Duddington, C. L., (42g).
Düwel, D., (34a).
Dugarte, I., (108a).
Duke, B. O., 222bh.
Dunin, M. S., 213j.
Dutt, S. C., (33d).
Dyson, F. L., 19d.
Dzięciołowski, Z., (166b).

Edelman, M. H., (161a).
Edeson, J. F. B., 13f, 222by.
Efremenko, V. P., 203x.
Eglitis, V. K., 203di.
Elam, G. W., (8b).
El-Banhawy, A., 141d.
El-Bitash, M. H., 141e.
El-Gindy, M. S., (142a).
Elizeev, K. M., 195a.
El Raggal, M., 77a.
Emanuilov, I., 137a.
Emdin, R., (93a), (93d).
Endo, B. Y., 35i, 48i.
Enigk, K., 34a, 96a.
Erasmus, D. A., 47j.
Ergens, R., 29c, 29d.
Erhardová, B., 29e.
Erkina, N. G., 195b.
Esber, J., (186f).
Euzéby, J., 118a, 189a, 189b.
Evans, A. S., 36a, 222j.
Evranova, V. G., 203dh.

Facey, R. V., 19c.
Fagasiński, A., 193a.
Fahmy, M. A. M., 76a.
Fain, A., 190b.
Farooqi, H. U., (175a).
Favati, V., (93d), 215c.
Fayez, M., 141f.
Feder, W. A., 42g.
Feigenbaum, E., 131e.
Feldmesser, J., 49m.
Fenwick, D. W., 12b, 198f, 198m, 198n.
Ferguson, F. F., (7g).
Fernando, P. V. D., 38a.
Ferreira, C. S., (131b), (184b).
Ferreira, M. O., (222cd).
Fielding, M. J., (4a), (49c).
Figueiredo, J. M. P. de, 222ch.
Flament, F., (222bt).
Flores B., F., (52a).
Floyd, jr., J. B., 39a.
Forstner, M. J., (18c).
Forsyth, B. A., 17b.
Fraga de Azevedo, J., 88a, 88b, 88c, 222z.
Frank, H., 153c.
Frankland, H. M. T., 47g.
Franklin, M. T., 198e, 198h.
Frazier, M. N., 105a.
Freitas, J. F. Teixeira de, 104a.
Freitas, J. R. de, (222s).
Friedheim, E. A. H., 13a, 222u.
Friedl, F. E., 351.
Frye, W. W., (222ci).
Fürst, C., (61a).
Furmaga, S., 1i.

Gabbanini, P., (93b).
Gaibov, A. D., 203o.
Gallego Berenguer, J., 187a.
Garabedian, G. A., 7i.
Garavini, C., (191a).
García, E. Y., 222cs.
García-Palmieri, M. R., 139a.
Garizhskaya, N. N., (206p), (206q).
Garkavi, B. L., (196b), 203p.
Gaskin, T. A., 49a.
Gatin, P. P., 209b.
Geller, E. R., 203q.
Gémesi, G., (153c).
Gemmell, M. A., 44a, 45a.
Gerbasio, A. E., 80a.
Gerbilski, V. L., 203r.
Ghosh, P. K., 119a.
Gibson, T. E., 3a, 13c, 72k.
Gier, H. T., 197a.
Gill, R. G., 44c.
Ginetsinskaya, T. A., 219d.
Gittinger, W. C., (95a).
Gönnert, R., 222v.
Goffart, H., 43n.
Goidànich, G., 191a.
Golikova, M. N., 219e.
Golvan, Y. J., 10a, 10e.
Gonçalves, N. B., (222y).
Gonçalves Ferreira, E., 88g.
González Castro, J., 59a.
Good, J. M., 48j, 49h, (49t).
Goodey, J. B., 43z.
Gordeeva, L. M., (130bm).
Gordon, J., 64a.
Gordon, J. G., (72f).
Gorina, N., 130bb.
Gossett, F. O., (71b).
Gottlieb, B., 54a.
Goulart, E. G., 183a.
Grabda, B., 21a.
Graber, M., 118b, 188a, 188b.
Grabowska, M., 73c.
Grainger, J. N. R., 47f.
Griffiths, I., (42i).
Grigoryan, G. A., 203s.
Grimaldi, A., (211c).
Grimaldi, E., (123a).
Grollman, S., (36i).
Gubanov, N. M., (84h), (203cc).
Guevara, D., 59c.
Guevara Pozo, D., 59d.
Guilford, H. G., 201a.
Guilhon, J., 113a, 113b.
Gunders, A. E. (222bf).
Güralp, N., 208b.
Gushanskaya, L. K., (203ck).

Habib, S. A., 141b.
Habib, Y. A., (141b).
Hacig, A., 101a.
Hague, N. G. M., 43r, 43s.
Halawani, A., 222a.
Hall, J. E., 35b.
Hamblen, M. L., 48k, (48o).
Hamvas, J. J., (120a).
Hanf, E., 164a.
Hansen, E. L., (198v).
Hare, W. W., 481.
Harnack, G. A. von, 125a.
Harrow, W. T., 72e, 72j.
Hartwich, G., 158a.
Haseeb, M. A., (13e).
Hawking, F., 222bp.
Heard, K. M., (99a).
Helderweirt, G., (222bt).
Herber, E. C., 173b.
Hesling, J. J., 43u, 198g.
Heyneman, D., 36k.
Hoffman, G. L., 200a.

Hollis, J. P., (4a), 49c.
Holló, F., 153b.
Hopper, B. E., 43d, (49e).
Horn, R., (147a).
Hovorka, J., 128a, 130 l.
Howard, H. W., 198t.
Hsieh, S. T., (30e).
Hsü, H. F., 222h.
Hsü, S. Y. Li, (222h).
Hubbard, E. D., (40f).
Hubendick, B., 222c.
Huchton, P., 147a.
Hughes, W. J., (62a).
Hunter, III, G. W., 222ca.
Hunter, W. S., (36h).
Hurmusiadis, A., 82c.
Hutchison, W. F., 35c.
Hutton, R. F., (40i).
Hutzler, L. B., (8b).

Ikkala, E., (92b).
Inglis, W. G., 76e, 190a.
Innella, F., 139b.
International Congress of Tropical Medicine & Malaria, 222.
Iseli, R., 199a.
Itagaki, H., 114a.
Ivanov, B. V., 69c.
Ivanova, T. A., 213k.
Ivashkin, V. M., 203ba, 203bb, 203bc, (203cn).
Ivashkina, E. E., 203z.
Iwańczuk, I., (1b).
Iyengar, M. O. T., 222bk.

Jachowski, jr., L. A., 222bw.
Jain, S. L., 47h.
Janecki, J., (166a).
Jansen, jr., J., 67c.
Janssens, P. G., 222bt.
Jemrić, K., (18e).
Jensen, H. J., 49 l.
Jeziorańska, A., 166c.
Jiménez Millán, F., 59b, 90a.
Jiménez-Quirós, O., (182a).
Johnson, R. T., (43w).
Jolivet, G., (113b).
Jones, F. G. W., 198b, 198 l.
Jordan, P., 13d, 222bn.
Jordon, A. W., (66a).
Jung, R. C., 222ck.
Jurášek, V., 128c.

Kabata, Z., 42c.
Kagan, I. G., 7f, 56a, 144a.
Kaipainen, W. J., 92a, 92b.
Kaktinya, D. K., (203di).
Kalandadze, L. P., 204a.
Karmanova, E. M., 203bd.
Karpovich, V. N., 203be.
Kasimova, G. A., 203bf.
Kassai, T., (153b).
Kašťák, V., 130t.
Keith, R. K., (17a).
Kendall, S. B., 47i.
Kershaw, W. E., 222bc.
Kessel, J. F., 222bj.
Khalil, H. M., (222cn).
Khalili, K., (97a).
Kharichkova, M. V., 206bv.
Khokholkova, N. A., 203cx.
Kikuchi, G., 106a.
Kilejian, A., (7d).
Kim, S. K., 100a.
Kirk, D. E., 35m.
Kirk, R., 13e, 121a.
Kiryanova, E. S., 79f, 213h.
Kisielewska, K., 1e.
Klimeš, B., 60a, 96b.
Klingler, J., 157a.
Kloetzel, K., 58d, 131d.
Kobulej, T., 84f.
Koike, K., (49 l).
Kononova, M. E., 203bh.
Kontrimavichus, V. L., 203bi.
Kopaev, Y. N., (84i).
Koppisch, E., 55a, (110f).
Koropov, V. M., 69d.
Kort, J., 68a.
Kotelnikov, G. A., (196d), (196e), 206b.
Koudela, K., 194d.
Kourí, A., (186c), (186f), (186g), (186h).
Koutz, F. R., (66a).
Kovács, F., 84e, (84j).
Koval, V. P., 203bg.
Kovalev, G. V., (206bd).
Kozicka, J., 1a.
Kozlov, D., (130g).
Krall, E., 43q.
Kralovánszky, U. P., (153e).
Krasnolobova, T., 130m.
Krilov, P., 130u.
Krishnan, K. S., (133b).
Krishnaswami, A. K., 133c.
Krotov, A. I., 84a.
Krupp, I. M., 35p.
Kubíček, K., (60a).
Kuiper, K., 68b.
Kuitunen, E., (120a).
Kulchitski, B. I., 213b.
K'ung, F. Y., 30e.
Kuntz, R. E., 7h.
Kupriyanova-Shakhmatova, R. A., 203bj.
Kurakata, T., (75a).
Kurochkin, Y. V., 84b, 130bc.
Kuźmicki, R., 166b.
Kuznetsov, M. I., 79i, 206c, 206f, (206p).
Kvyatkovski, V. N., (195d).

Labruyere, R. E., (68d).
Labzoffsky, N. A., 120a.
Lagana, I., 82b.
Laigret, J., (222bj).
Laine, T., 91a.
Laird, E., (217).
Laird, M., 217.
Lal, M. B., 42f.
Landram, J. F., (126a).
Larivière, M., 116b.
Laurie, J. S., 36m.
Lauroy, J., (116b).
Lautz, W. H., 49f.
Lavabre, E. M., 192a.
Lawless, D. K., (7h).
Layrisse, M., 108a.
Lazarov, E., (18d).
Lear, B., 49p, 49w.
Leather, R. I., 22a.
Lechleitner, R. R., 25a.
Lee, B. K., (5a).
Lee, R. P., (72b).
Lei, S. S., 30c.
Leland, jr., S. E., (8b).
Levashov, M. M., 203bk.
Levine, D. M., 35g.
Lewis, D. J., 65c, 222bg.
Lewis, G. D., 35f.
Lewis, P. B., 138a.
Li, M. M., (30e).
Li, S. C., (30d).
Lider, L. A., (49p).
Liebmann, H., 18b.
Lie Kian Joe, 222bm.
Linard, R., 11a.
Lindhardt, K., 218.
Linford, M. B., (49r).
Lippi, M., 186a.
Lizcano Herrera, J., (59a).
Llewellyn, J., 42h.
Logachev, E. D., 103v, 130bj.
Logginov, S. B., 206bk, 206bl.
Lokki, O., (91a).
Longhurst, W. M., (8d).
López Rico, A., 185a, 185c.
Lordello, L. G. E., 58c, 180a.
Lörincz, F., 153e.
Loughlin, E. H., 95a.
Lower, E. S., (19a).
Lownsbery, B. F., 169a.
Loyo Díaz, C., (185a), (185c).
Lubinsky, G., 28c.
Luc, M., 43c, 102a.
Lucchese, A. del, 93e.
Lucký, Z., 60d, 214a.
Lukashenko, N. P., 206k, (206bg).
Lýsek, H., 122a.
Lyubimov, M. P., 203bl.

McBeth, C. W., 65b.
McCowen, M. C., 71b.
Machnicka, B., (193a).
Mackenzie, A., 72i.
McKinney, H. E., (49u).
Macko, J. K., 29f, (130 l), 130n, 130o.
McLaughlin, F. W., (48n).
McNamee, J. M., (49d).
Macy, R. W., 222bb.
Maghami, G., 97a.
Magill, R., (173b).
Makarenko, V. K., 203bm.

Malakatis, G. M., (7h).
Malakhova, E. I., 206be.
Malčić, B., (18e).
Maldonado, J. F., 7b, 110a, (110b), 110c, 110e.
Malheiro, D. de M., 184a.
Malik, B. S., 135a.
Mamaev, Y. L., 203bn, 203bo.
Mamonova, Z. M., 203bp.
Mandelli, G., 123a, 123b.
March, H. N., (222bj).
Marinari, A., 136a.
Markov, G. S., (203k).
Marlatt, R. B., 49n.
Martin, G. C., 43t.
Martin, J. P., (49 l).
Martos Gutiérrez, M. L., (59a).
Mastronardi, M., 81a.
Matevosyan, E. M., 130p, (203dg), 206n, 206o, 206p, 206q.
Mathies, jr., A. W., 36c, 36d.
Matossian, R. M., (7i).
Matov, K., 130bi.
Matsumoto, T., 146a, 146b.
Mazidis, S. P., 82a.
Mazzotti, L., 185b.
Meijneke, C. A. R., 65a.
Meira, M. T. V. de, (222cq).
Melis, G., 163a.
Meshcheryakov, P. A., 209a.
Meshkov, M. M., 79c.
Mesquita, J. F. F., 222cc.
Michajłow, W., 79h, 130w.
Millar, R., 57a.
Millemann, R. E., 36 l.
Miller, M. J., 222bf.
Minning, W., 222br.
Minton, N. A., 49e.
Minz, G., 150a.
Mioli, M., 215a.
Mirza, M. B., 175a.
Mitskevich, V. Y., 130q, 205a.
Mituch, J., 130d.
Miyazaki, I., 222cr.
Monné, L., 103a, 103b.
Monteiro, F. P., (180a).
Monteoliva, M., (59c).
Moon, C. H., (5a).
Morais, T. de, 88d, 88e, 222t.
Morel, P. C., 188c.
Morettini, B., 123c.
Morgan, H. V., (13e).
Morozov, Y. F., 203br.
Morrissey, L. P., (120a).
Mortelli, U., 93b.
Morton, D. J., 49j, 49k.
Mountain, W. B., 27a.
Moura Pires, F., 88i.
Mousa, A. H., 222 l.
Mozgovoi, A. A., 69f, 130x, 203bq.
Muchlis, A., 37a, 37b.
Muhleisen, J. P., 87a.
Mullin, W. G., (95a).
Mulvey, R. H., 43a, 43v, 43y.
Myer, D. G., 35e.
Myers, E. N., 6a.
Myers, R. F., 49o.
Mykytowycz, R., 42e.
Myuge, S. G., 130e, 213d.

Nagano, A., 75a.
Nagaty, H. F., 142a, 222cn.
Nagibina, L. F., (79d).
Nair, C. P., 133b.
Najarian, H. H., 222x.
Nanda, D. K., (133d).
Nardi, E., 211c.
Nath, K., 140a.
Nazarova, N. S., 203bs, (203cd).
Neghme, A., 222cg.
Negrón, R., (6a).
Nekhaev, V. M., 79b.
Nemeséri, L., (153e).
Neuman, M., 179a.
Newsom, L. D., (4a).
Nicholas, W. L., 198u.
Nickel, E. A., 18a.
Nicolson, T. B., 72f.
Nielsen, L. W., 48d.
Nikulin, T., 130bf.
Nikulina, N. K., 203bt.
Nirula, K. K., 33c.
Norman, L., 7e, (7f), (144a).
Norton, D. C., 49g.

Oba, N., (151b).
Odening, K., 76b, 76c.
Oei Hong Peng, 155a.
Ogren, R. E., 173a.
Ohela, K., (92a).
Ohtsuka, T., (75a).
Okabe, K., 151b.
Okorokov, V. I., (206n), (206o).
Oliveira Lecuona, M. de, 88f.
Oliveira e Silva, J. A. A., (88i).
Oliver-González, J., 7g, (55a), (110a), (110b), 222m.
Olivier, L., 222d.
Oostenbrink, M., 68c.
Oshmarin, P. G., 73b, 84d, 130y.
Osikovski, E., (130bi).
Otto, G. F., 71a.
Ouden, H. den, 68d.
Oytun, H. S., 208a.
Ozerskaya, V. N., 203bu.

Pacheco, G., (222ck).
Paine, D. H. D., 19a.
Pan, D. Y., 30a.
Panasyuk, D. I., 203bx, 206bn.
Pandeya, S. N., (140a).
Pandit, C. N., (149a).
Paramonov, A. A., 213g.
Paravissini, F., 110b.
Parmala, M. E., (91a).
Paruzhinskaya, L. S., (130bn).
Paskalskaya, M. Y., 206d.
Pätiälä, R., (91a).
Patrick, Z. A., (27a).
Pattanayak, S., (133c).
Pavlov, A. V., 130f, (130h), 203bv, 203bw.
Pavlov, P., 18d.
Pawłowski, Z., 29i.
Peacock, F. C., 43f.
Pearlstein, H., (6a).
Pearson, J. C., 47e.
Pellegrini, D., 211b.
Pellegrini, N., (93a), (215b).
Pérez Tamayo, R., 52a.
Perlowagora-Szumlewicz, A., 222q.
Perry, V. G., 35a, 43m.
Peters, B. G., 198q.
Petit, J. P., (113a).
Petris, M. A., 72d.
Petrochenko, V. I., 196d, 196e, (203dg), 206i, (206q).
Petrov, A. M., 130z, 196c, 206h, 206t, 206u, 206bf.
Petrova, Z. I., 213c.
Phifer, K., (36e).
Pieracci, F., (215a).
Pike, E. H., 40b.
Pimentel, D., 127a, 127b.
Piringer, E., (156a).
Piringer, W., 83a, 156a.
Pitcher, R. S., 198i.
Podyapolskaya, V. P., 130bd, 203by, 222co.
Polozhentsev, P. A., 79g.
Polyakova, O. I., 130bl, (203bx), 206j, 206bm.
Polyanski, Y. I., 219.
Popovich, A. S., 213 l.
Potekhina, L. F., 206r, 206s, (206bb), (206bu).
Potemkina, V. A., 206g, 206bg.
Poucher, C., (49d).
Powell, N. T., 35j.
Prates, M., 222n.
Premvati, 28b.
Prestage, J. J., 35r.
Pricoli, T. I., 131c.
Prokopič, J., 29j, 122b.
Proshin, I. G., 203bz.
Przyjałkowski, Z., (113c).
Pustovoi, I. F., 206bh.

Quenum, C., (116c).

Rachou, R. G., 222cd.
Raffucci, F. L., (139a).
Raghavan, N. G. S., (133c).
Ragheb, M., (141f).
Rai, P., (135a), 172a.
Rakhmanov, A. M., 195c.
Ramakrishna, G., 33b.
Ramirez, J., (106a).
Ramos-Oller, A., (110d).
Rankin, H. W., 49t.
Rapić, S., 18e.
Raski, D. J., 24a, 43w.
Ratcliffe, T. J., (49h).

Rausch, R., **222cl.**
Rawes, D. A., (**72h**).
Read, C. P., **36e, 36g.**
Rebois, R. V., (**49m**).
Redner, W. J., (**139b**).
Rees, D. M., (**222bm**).
Rees, G., **47k.**
Retolaza Díaz, T., (**185a**), (**185c**).
Reuver, I., **43b.**
Rhoades, H. L., **49r.**
Ribaltovski, O. V., **203ca.**
Ribeiro Netto, A., **184c.**
Rice, D. T., 134a.
Richter, S., **70a.**
Riezebos, D., (**68e**).
Rifaat, M. A., (**222cn**).
Riggs, R. D., **35k.**
Rikovski, A. S., **203ce.**
Rizhikov, K. M., **130g, 130h, 203cb, 203cc, 203cd.**
Roberts, F. H. S., **17a.**
Roche, M., (**108a**).
Rodrigues de Silva, J., **222k.**
Rohde, K., **77b.**
Rolfe, S. W. H., **198k.**
Romashchenko, E. I., **196f.**
Rook, H. de, **222bz.**
Rosenberg, E., **86a.**
Ross, J. G., **72b.**
Ross, J. P., **48m.**
Rothacker, D., **216a.**
Roy, R. G., (**133b**).
Rudyakova, N. A., (**206i**).
Rühm, W., **43k.**
Ruffié, J., **222cq.**
Russel, D. A., (**4a**).
Ryšavý, B., **84g.**

Sadun, E. H., **5a**, (**7e**), **222cm.**
Saif, M., (**141a**), (**141c**), (**141e**).
Saldaña, J., (**94a**).
Salentiny, T., **43x.**
Salutini, E., **93c.**
Sanches, W. R. R., **222ba.**
Sanderson, A. R., **174a.**
Sani, A., 152a.
San Juan, F., 131a.
Sankale, M., (116a).
Sansarricq, H., **154a**, (**154b**).
Santos David, J. H., (**88i**).
Sapelina-Belokurskaya, V. I., **203cf.**
Sarmiento, L., **40c.**
Sasser, J. N., (**48d**), (**48h**), **48n.**
Satti, M. H., (**13e**).
Saunders, D. C., **40d, 222bs.**
Savinov, V. A., (**206t**).
Sayed, B. A., 132a.
Scarnell, J., **72h.**
Schacher, J. F., (**7k**).
Schad, G. A., **28a.**
Schanzel, H., **60c.**
Schell, S. C., **162a.**
Schiller, E. L., **36j.**
Schinazi, L. A., (**7d**).
Schleder, E. G., (**49s**).
Schneider, J., **154b.**
Schraufstätter, E., (**222v**).
Schreiber, W., **129a.**
Schroeder, P. J., **170a.**
Schuster, M. L., **49b.**
Schwabe, C. W., **7c, 7d.**
Schwartz, B., **8a.**
Scognamiglio, A., **176a.**
Scott, J. A., **222bq.**
Seifert, H., **210a.**
Seinhorst, J. W., **43i, 43 l, 68e, 198c, 198d.**
Seki, J., (75a).
Selim, M. K., (**76a**).
Semenov, V. L., **203cg.**
Sgambati, A., 215d.
Shah, H. L., **149a, 149b.**
Shah, S., (132a).
Shaltikov, S. S., (195a).
Shanks, P. L., **63a.**
Sharpilo, V. P., **203da.**
Shaver, R. J., 126a.
Shepherd, A. M., **42k.**
Sher, S. A., **212a.**
Shikhobalova, N. P., **130bn, 203db, 203dc.**
Shirakawa, M., **151a.**
Shmalko, V. F., **203dd.**
Shmitova, G., **130ba.**
Shokina, N. P., **206bi.**
Shrivastava, R. N., (**133e**).
Shtein, G. A., **219f.**
Shulman, E. S., 203de.
Shults, R. S., **29g, 203df.**
Shumakovich, E. E., 203dg.
Siedlecki, E., **1g.**
Sigalas, R., 145a.
Silver, C. N., (**68b**).
Silverman, P. H., **42b, 47a.**
Simmons, jr., J. E., (**36g**).
Singh, M. V., (**133d**), (**133e**).
Sinha, A. P., **133d.**
Sippel, W. L., **71c.**
Skarbilovich, T. S., **1d, 203ch, 206br, 206bs, 206bt, 206bu.**
Skryabin, K. I., 203a, 203ci, **203cj, 203ck.**
Slack, D. A., (**48k**), **48o.**
Slater, W., **72 l.**
Smirnov, P. V., **203cl.**
Smitskamp, H., 160a.
Soares, R. de R. L., **222y.**
Sogandares-Bernal, F., **40i, 207a.**
Sokol, J., (**128d**).
Solomon, P., (**101a**).
Sommerville, R. I., (**42d**).
Sonin, M., **130i.**
Soprunov, F. F., **203cp.**
Sorokina, V. V., (**206bj**).
Soulsby, E. J. L., **42d.**
Sousa, H. T. de, (**222cq**).
Southey, J. F. [Editor], **198.**
Spasskaya, L. P., **84c, 84i, (130j), (203co), (203ct).**
Spasski, A. A., **79a, 84h, 130j, 130r, 203cm, 203cn, 203co.**
Spears, J. F., **2a, 2b.**
Spingarn, C. L., 161a.
Srivastava, H. D., **33d.**
Sroufe, jr., S. A., 35h.
Staniland, L. N., **198a, 198r, 198s.**
Staninec, M., 222cp.
Steele, A. E., (**48j**), (**49h**).
Stefański, W., 73a, **113c, 130bk, 167a.**
Steiner, G., **181a.**
Stelter, H., (**216a**).
Stewart, D. F., (**42d**).
Sticinsky, E., (**96a**).
Stirewalt, M. A., (**36a**), **222i.**
Stoev, P., (**18d**).
Storozheva, A. M., **206v.**
Strich-Harari, D., (**150a**).
Sudakova, I. M., **203cq.**
Sudarikov, V. E., **203cr.**
Suidan, F. G., (**7i**).
Sultanov, M. A., **203cs, 203ct.**
Svadzhyan, P. K., **69b.**
Swartz, L. G., **35n.**
Swartzwelder, J. C., (**87a**), **222ci.**
Symes, C. B., **220.**
Szotáczky, I., **153d.**

Taha, A., (**141a**), (**141e**).
Takeshita, Y., (75a).
Takeuchi, M., (75a).
Tareeva, A. I., **203cu.**
Tarjan, A. C., **49v.**
Tatarov, B., (**18d**).
Taylor, A. L., (**49m**).
Taylor, D. P., **49s.**
Tendetnik, Y. Y., (**203cp**).
Tereshchenko, E. F., (213i).
Thatcher, V. E., **171b.**
Thomas, J. D., **40h.**
Thomason, I. J., **49u**, (**169a**).
Thompson, H. W., **198j.**
Thompson, P. E., 115d, (**222x**).
Thonard, J. C., (**36 l**).
Tiktin, N. V., 213e.
Todd, E. H., **48e**, (**48f**).
Tölgyesi, G., **153a.**
Tolmsoff, W. J., **48c.**
Tóth, I., (**153d**).
Treskova, V. S., **213a.**
Trnka, F., (**60a**).
Tsvetaeva, N. P., **130bh, 206bo, 206bp, 206bq.**
Tulaganov, A. T., 203cv.
Turner, J. H., **8c, 40e.**

Uilenberg, G., **67a.**
Ulmer, M. J., (**170a**).
United States Department of Agriculture, 221.
Ustinov, A. A., **213i.**

Vaga, A. C., **222bx.**
Valcarcel, M. I., 110d.
Van de Erve, J., **14a.**
Van der Sar, A., (**160c**).
Van Overbeek, J., **62a.**
Vasilev, A. A., **196b, 206y.**
Vasilev, I., **124a,** (**130bi**).
Vasilkov, G. V., **206a, 206e.**
Vasilkova, Z. G., 203m.
Velikovskaya, Y. A., (**69e**), (**130bm**).
Vernberg, W. B., **36h.**
Veselova, T. P., **69e, 130bm.**
Viduts, L. P., (**195d**).
Villarejos, V. M., **94a.**
Vingiani, A., (**80a**).
Vinke, B., **160c.**
Vinnichuk, R. I., (**203bh**).
Vladimirov, V. L., (**203k**).
Vodrážka, J., (**128d**), **130bo.**
Voitenko, A. N., (213 l).
Volgar-Pastukhova, L. G., **219c.**
Voznaya, A. T., **203n.**
Vsevolodov, B. P., 202a.

Wagner, E. D., (**7a**), **7 l.**
Wallace, H. R., **12a, 198p.**
Walton, A. C., **40a.**
Walton, B. C., **117a.**
Warren, K. S., 222 o.
Watson, J. M., **222w.**
Webb, W. R., (99a).
Webbe, G., **41a.**
Wegmann, T., **61a.**
Welch, H. E., **47d.**
Weller, T. H., 222p.
Wells, J. C., (**48h**).
Welsh, J. F., (**36k**).
Wharton, R. H., (**222by**).
White, jr., P. C., (**127a**), (**127b**).
Whitehead, A. G., **43g, 43j, 43p.**
Whitlock, J. H., **31a.**
Whitlock, L. S., (**49c**).
Widdowson, E., (**12b**), **198o.**
Wikerhauser, T., **70b.**
Wilcox, G. E., **4a.**
Williams, E. R., **117c.**
Williams, H. H., **47b, 47c.**
Williams, J. R., **46a.**
Wilson, R. F., 66a.
Wilson, T., **222bl.**
Winkler, L. R., **7a.**
Winter, H. A., **89c.**
Wismer, C. A., (**49 l**).
Wong Chi, L., (**7 l**).
Woodcock, R. C., (**15a**).
Wright, C. A., **42j,** 222e.
Wright, W. H., **222ce.**
Wu, Y. T., **143a.**
Wyant, K. D., **35o.**
Wyant, Z. N., (**8b**).
Wykoff, D. E., **35q, 36f, 40g.**

Yanchev, Y., (**130bi**).
Yang, C. T., (**30e**).
Yau, J. L., **30d.**
Yogore, jr., N. G., **165a.**
Yutuc, L. M., **222cb.**

Zago Filho, H., **58a, 58b.**
Zajíček, D., **194c.**
Zapart, W., (**166c**).
Zdun, W., **1c.**
Zemlyanskaya, A. I., **203y.**
Zendulka, M., **194a.**
Zimmermann, W. J., **40f.**
Žitňan, R., **130k.**
Zoltai, N., **29h.**

INDEX OF PERIODICALS

(The reference is to the **serial** number, not to the page.)

Acta Medica Italica di Malattie Infettive e Parassitarie, 80.
Acta Medica Veterinaria. Naples, 81.
Acta Microbiologica Hellenica, 82.
Acta Parasitologica Polonica, 1.
Acta Tropica. Basle, 83.
Acta Veterinaria. Budapest, 84.
Agricoltura delle Venezie, 85.
Agricultural Chemicals. Baltimore, 2.
Agriculture. London, 3.
Agronomy Journal, 4.
American Journal of Clinical Pathology, 86.
American Journal of Gastroenterology, 87.
American Journal of Hygiene, 5.
American Journal of the Medical Sciences, 6.
American Journal of Tropical Medicine and Hygiene, 7.
American Journal of Veterinary Research, 8.
American Midland Naturalist, 9.
Anais do Instituto de Medicina Tropical. Lisbon, 88.
Anales del Instituto de Biología. Mexico, 89.
Anales de la Real Academia de Farmacia. Madrid, 90.
Annales Medicinae Experimentalis et Biologiae Fenniae, 91.
Annales Medicinae Internae Fenniae, 92.
Annales de Parasitologie Humaine et Comparée, 10.
Annales de la Société Belge de Médecine Tropicale, 11.
Annali della Facoltà di Medicina Veterinaria. Pisa, 93.
Annals of Applied Biology, 12.
Annals of Tropical Medicine and Parasitology, 13.
Antibiotic Medicine and Clinical Therapy. New York, 94.
Antibiotics Annual. New York, 95.
Archiv für Geflügelkunde, 96.
Archives of Dermatology, 14.
Archives of Disease in Childhood, 15.
Archives de l'Institut d'Hessarek, 97.
Archives de l'Institut Pasteur d'Algérie, 98.
Archives of Internal Medicine, 99.
Archives of Neurology. Chicago, 100.
Archives Roumaines de Pathologie Expérimentale et de Microbiologie, 101.
Archives de Zoologie Expérimentale et Générale, 102.
Arkiv för Zoologi, 103.
Arquivos do Museu Nacional. Rio de Janeiro, 104.
Australian Journal of Agricultural Research, 16.
Australian Veterinary Journal, 17.
Avian Diseases. Ithaca, 105.

Berliner und Münchener Tierärztliche Wochenschrift, 18.
Biochimica et Biophysica Acta, 106.
Biológico. São Paulo, 107.
Blood. New York, 108.
Boletim do Instituto Biológico da Bahia, 109.
Boletín de la Asociación Médica de Puerto Rico, 110.
Boletín Venezolano de Laboratorio Clínico, 111.
Bragantia. Campinas, 112.
British Medical Journal, 19.
British Veterinary Journal, 20.
Bulletin de l'Académie Polonaise des Sciences. Classe II. Série des Sciences Biologiques, 21.
Bulletin de l'Académie Vétérinaire de France, 113.
Bulletin of the Azabu Veterinary College, Japan, 114.
Bulletin of the Calcutta School of Tropical Medicine, 115.
Bulletin. Ministry of Food and Agriculture, Ghana, 22.
Bulletin de la Société Médicale d'Afrique Noire de Langue Française, 116.
Bulletin of the World Health Organization, 117.
Bulletin of the Zoological Society, College of Science, Nagpur, 23.

Cahiers de Médecine Vétérinaire, 118.
Calcutta Medical Journal, 119.
California Agriculture, 24.
California Fish and Game, 25.
Canadian Insect Pest Review, 26.
Canadian Journal of Botany, 27.
Canadian Journal of Microbiology, 120.
Canadian Journal of Zoology, 28.
Central African Journal of Medicine, 121.
Československá Epidemiologie, Mikrobiologie, Imunologie, 122.
Československá Parasitologie, 29.
Chinese Veterinary Journal, 30.
Clinica Veterinaria. Milan, 123.
Comptes Rendus de l'Académie Bulgare des Sciences, 124.
Cornell Veterinarian, 31.
Countryman. Nicosia, 32.
Current Science. Bangalore, 33.

Deutsche Medizinische Wochenschrift, 125.
Deutsche Tierärztliche Wochenschrift, 34.
Dissertation Abstracts, 35.
Down to Earth. Midland, Michigan, 126.

Ecology, 127.
Experimental Parasitology. New York, 36.

Folia Veterinaria. Košice, 128.

Gastroenterology. Baltimore, 129.

Helminthologia. Bratislava, 130.
Hemera Zoa. Buitenzorg, 37.
Hospital. Rio de Janeiro, 131.

Indian Journal of Child Health, 38, 132.
Indian Journal of Malariology, 133.
Indian Journal of Public Health, 134.
Indian Journal of Veterinary Science and Animal Husbandry, 135.
Informatore Fitopatologico. Bologna, 136.
Izvestiya Akademii Nauk SSSR. Seriya Biologicheskaya, 137.

Journal of Agriculture of Western Australia, 138.
Journal of the American Medical Association, 139.
Journal of the Association of Physicians of India, 140.
Journal of the Egyptian Medical Association, 141.
Journal of the Egyptian Veterinary Medical Association, 142.
Journal of the Formosan Medical Association, 143.
Journal of Immunology, 144.
Journal of the Kentucky State Medical Association, 39.
Journal de Médecine de Bordeaux et du Sud-Ouest, 145.
Journal of the Osaka City Medical Center, 146.
Journal of Parasitology, 40.
Journal of Pediatrics, 147.
Journal of the Tennessee Academy of Science, 148.
Journal of Tropical Medicine and Hygiene, 41.
Journal of Veterinary and Animal Husbandry Research. Mhow, India, 149.

Ktavim. Rehovot, 150.
Kurume Medical Journal, 151.

Lotta contro la Tubercolosi. Rome, 152.

Magyar Állatorvosok Lapja, 153.
Médecine Tropicale, 154.
Menara Perkebunan. Batavia, 155.
Mikroskopie. Vienna, 156.
Mitteilungen der Schweizerischen Entomologischen Gesellschaft, 157.
Mitteilungen aus dem Zoologischen Museum in Berlin, 158.
Mycologia, 159.

Nature. London, 42.
Nederlands Tijdschrift voor Geneeskunde, 160.
Nematologica, 43.
New England Journal of Medicine, 161.
New Zealand Journal of Agriculture, 44.
New Zealand Veterinary Journal, 45.
Northwest Science, 162.
Nota Pratica. Stazione di Entomologia Agraria, Firenze, 163.

Occasional Paper. Mauritius Sugar Industry Research Institute, 46.

Parasitology, 47.
Pflanzenschutz. Munich, 164.
Philippine Journal of Science, 165.
Phytopathology, 48.
Plant Disease Reporter, 49.
Polski Tygodnik Lekarski. Warsaw, 166.
Popularne Monografie Zoologiczne. Warsaw, 167.
Postgraduate Medical Journal. London, 50.
Praktische Tierarzt (Der), 51.
Prensa Médica Mexicana, 52.
Proceedings of the Alumni Association, Malaya, 168.
Proceedings of the American Society for Horticultural Science, 169.
Proceedings of the Iowa Academy of Science, 170.
Proceedings of the Linnean Society of New South Wales, 53.
Proceedings of the Louisiana Academy of Science, 171.
Proceedings of the National Academy of Sciences, India. Section B, 172.
Proceedings of the Pennsylvania Academy of Science, 173.
Proceedings of the Royal Society of Edinburgh. Section B, 174.
Proceedings of the Royal Society of Medicine, 54.
Proceedings of the Society for Experimental Biology and Medicine, 55.
Proceedings of the Zoological Society of Bengal, 175.
Progresso Agricolo. Bologna, 176.
Public Health Reports. Washington, 56.

Quarterly Journal of Microscopical Science, 177.
Queensland Agricultural Journal, 57.
Queensland Journal of Agricultural Science, 178.

Refuah Veterinarith. Jerusalem, 179.
Revista de Agricultura. São Paulo, 180.
Revista de Agricultura de Puerto Rico, 181.
Revista de Biología Tropical. Universidad de Costa Rica, 182.
Revista Brasileira de Biologia, 58.
Revista Brasileira de Medicina, 183.
Revista da Faculdade de Medicina Veterinária. São Paulo, 184.
Revista Ibérica de Parasitología, 59.
Revista del Instituto de Salubridad y Enfermedades Tropicales. Mexico, 185.
Revista Kuba de Medicina Tropical y Parasitología, 186.
Revista de Sanidad e Higiene Pública. Madrid, 187.
Revue d'Élevage et de Médecine Vétérinaire des Pays Tropicaux, 188.
Revue de Médecine Vétérinaire, 189.
Revue de Zoologie et de Botanique Africaines, 190.
Rivista della Ortoflorofrutticoltura Italiana, 191.
Riz et Riziculture et Cultures Vivrières Tropicales, 192.
Roczniki Nauk Rolniczych. Seria E. Weterynarii, 193.

Sborník Československé Akademie Zemědělských Věd. Veterinární Medicina, 194.
Sbornik Nauchnikh Trudov Semipalatinskogo Zootekhnichesko-Veterinarnogo Instituta, 195.
Sbornik Nauchno-Tekhnicheskoi Informatsii Vsesoyuznogo Instituta Gelmintologii im. K. I. Skryabina, 196.
Sborník Vysoké Školy Zemědělské a Lesnické v Brně. Řada B. Spisy Fakulty Veterinární, 60.
Schweizerische Medizinische Wochenschrift, 61.
Science, 62.
Scottish Agriculture, 63.
South African Sugar Journal, 64.
Span. London, 65.
Speculum, 66.

Technical Bulletin. Kansas Agricultural Experiment Station, 197.
Technical Bulletin. Ministry of Agriculture, Fisheries and Food. London, 198.
Tierärztliche Umschau, 199.
Tijdschrift voor Diergeneeskunde, 67.
Tijdschrift over Planteziekten, 68.
Transactions of the American Fisheries Society, 200.
Transactions of the Wisconsin Academy of Sciences, Arts and Letters, 201.
Trudi Alma-Atinskogo Zooveterinarnogo Instituta, 202.
Trudi Gelmintologicheskoi Laboratorii. Akademiya Nauk SSSR, 203.
Trudi Gruzinskogo Ordena Trudovogo Krasnogo Znameni Selskokhozyaistvennogo Instituta, 204.
Trudi Voronezhskogo Zoovetinstituta, 205.
Trudi Vsesoyuznogo Instituta Gelmintologii Imeni Akademika K. I. Skryabina, 206.
Tulane Studies in Zoology. New Orleans, 207.
Türk Veteriner Hekimleri Derneği Derğisi, 208.

Uchenie Zapiski Kazanskogo Gosudarstvennogo Veterinarnogo Instituta imeni N. E. Baumana, 209.

Veterinär-Medizinische Nachrichten. Marburg, 210.
Veterinaria Italiana, 211.
Veterinariya, 69.
Veterinarski Arhiv, 70.
Veterinary Medicine, 71.
Veterinary Record, 72.

Wiadomości Parazytologiczne, 73.
World Health. Geneva, 74.

Yearbook. California Avocado Society, 212.
Yokohama Medical Bulletin, 75.

Zashchita Rasteni ot Vreditelei i Boleznei, 213.
Zeitschrift für Parasitenkunde, 76.
Zeitschrift für Tropenmedizin und Parasitologie, 77.
Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. Abteilung 2, 78.
Zoologicheski Zhurnal, 79.
Zoologické Listy. Brno, 214.
Zooprofilassi, 215.
Züchter, 216.

HELMINTHOLOGICAL ABSTRACTS
Vol. 28, Parts 1 & 2

INDEX OF SUBJECTS

(The reference is to the serial number: numbers in **bold** type indicate abstracts.)

Abbreviata borneensis n.sp. in *Varanus rudicollis* **28a.**
Acanthocephalan larvae in crustaceans in Russia **219f.**
Acanthocephalans in fresh-water fish in Russia **203g.**
—, morphology, evolution **84d.**
Acanthocheilonema perstans in man in Angola **88i.**
— — — — — Cameroons **160b.**
Accacladocoelium alveolatum to *Guschanskiana* n.g. **203cj.**
Aelurostrongylus abstrusus in cat **67c.**
Africa, see also specific territories.
—, onchocerciasis **121a.**
—, schistosomiasis 222a.
Agapornis cana, Splendidofilaria gretillati n.sp. in **10d.**
Alaria, biology **203cr.**
Alariinae synonym of Diplostominae **47e.**
Alces alces, helminths in **203ce.**
Algeria, see also Africa.
—, *Muspicea borreli* **98a.**
Allocreadium carparum n.sp. in *Cyprinus carpio* **76b.**
America, see also specific territories.
—, filariasis **222bw.**
—, hydatidosis **222cg.**
Amidostomum anseris in goose, larval development **84f.**
— —, life-history **196e.**
— *orientale* n.sp. in *Clangula hyemalis* & *Somateria spectabilis* in Russia **130h.**
Amphibians, see Animals, generic & group names.
Amphidomermis for *Mesomermis sphaerocephala* **79g.**
Amplicaecum schikhobalovi in snakes, localization in liver **203bq.**
Amurotrema dombrowskajae n.g., n.sp. in *Ctenopharyngodon idella* in Russia **203h.**
Ananas sativus, Criconemoides ferniae n.sp. on **43c.**
— —, — *onoense* n.sp. on **43c.**
Anas querquedula, Dendritobilharzia pulverulenta in **130o.**
Ancylostoma, see also Hookworm.
— larvae controlled by fungi **203cp.**
— *caninum* in dog, haematology & immunology **35p.**
Ancylostomiasis, see also Hookworm anaemia.
— in man in India 140b.
— — —, nitrated aluminium naphtholate **141c.**
— — —, tetrachlorethylene **185a.**
— — —, treatment 186a.
Angola, see also Africa, West Africa.
—, *Acanthocheilonema perstans* **88i.**
—, *Schistosoma haematobium* **88h.**
—, schistosomiasis **88g.**
Anguina, morphology & host-parasite relationships **198c.**
— *cecidoplastes* to *Nothanguina* n.g. **43j.**
Angularella spp. to *Vitta* **130j.**
Animals, see also generic & group names.
—, chenopodium oil 206bf.
—, *Cysticercus bovis* in **188a.**
—, — *dromedarii* in **188a.**
—, filariids in **222bp.**
—, helminths in 29b, **101a, 118a, 188b, 203cn.**
—, hydatid in **7e,** 32a, **35c, 185b.**
—, *Physocephalus sexalatus* larva in **203cd.**
—, *Schistosoma mansoni* in **110c.**
—, schistosomiasis in **222w.**
—, *Spirocerca lupi* larva in **203cd.**
—, toxicity of dithiazine to **113b.**
—, *Wuchereria malayi* in **222by.**
—, domestic, see also Buffalo, Cat, Cattle, Dog, Goat, Horse, Pig, Poultry, Sheep, Zebu.
—, —, cyanacethydrazide **199a.**
—, —, helminths in **18b, 67a, 149a, 179a, 188c,** 203dg.
—, —, hydatid in **211a.**
—, —, Neguvon **210a.**
—, fur-bearing, see also Fox, generic names.
—, —, *Diphyllobothrium* in **206h.**
—, laboratory, see also Guinea-pig, Hamster, Monkey, Mouse, Rabbit, Rat, *Sigmodon hispidus*.
—, —, *Clonorchis sinensis* in **35q.**
—, —, *Dicrocoelium dendriticum* in **69b.**
—, —, garlic **60b.**
Anisakis larvae from *Gadus callarias*, culture *in vitro* **47f.**
Anisus contortus, Cercaria contorti n.sp. in **219d.**
Anomotaenia spp. to *Vitta* **130j.**
— *ancora* n.sp. in *Capella stenura* in Russia **203bo.**
— *depressa* to *Neolagia* **130j.**
— *globula* ova, morphology **84i.**
— *nymphaea* f. *megacantha* n.forma in *Numenius arcuatus* in Russia **84c.**
Anseriformes, see also Birds, generic & group names.
—, cestodes in **203cc.**
Anthelmintics, see also Control, Treatment.
—, 6171 RP **154b.**
—, acridine derivatives **118b.**
—, Alcopar **88b,** 115c.
—, aminoacrichin & carbochol **206bh.**
—, arecoline **203o.**
—, ascaridole **199c.**
—, Atonin **206bg.**
—, benzine **60a, 193a.**
—, bephenium embonate **3a, 72h.**
—, 1-bromo-2-naphthol 115a.
—, *n*-butylidene chloride **206bi.**
—, carbon tetrachloride **69e, 69f, 84e, 84j, 130bm, 153d,** 203s, **206z, 206bb, 206bc, 206bi.**
—, *Carica papaya* seed **38a.**
—, Cestodin **125a.**
—, — deteriorating with age **29i.**
—, chenopodium oil 206bf.
—, copper compounds **130be.**

Anthelmintics, *o*-cresol **18d.**
—, cyanacethydrazide **72j, 153b, 199a, 199c.**
—, — & phenothiazine **199b.**
—, diethylcarbamazine **133d.**
—, difluorotetrachlorethane **203w.**
—, Dipterex **30e.**
—, dithiazanine **19a, 87a, 88c, 110b, 113b, 131b, 160c, 222ci.**
—, — iodide **94a,** 186c.
—, ditrazine **206x, 206y, 206bg.**
—, — phosphate **153b.**
—, — salts **203bu.**
—, *Ficus* spp. latex **222cn.**
—, filixan **196b, 206bh.**
—, Freon-112 **206bc, 206bd.**
—, garlic **60b.**
—, glucosamine **95a, 141a.**
—, hetrazan **128d, 143a.**
—, hexachlorethane **72e, 203s, 203cl, 206bb.**
—, hexachlorophene **67b.**
—, hygromycin **105a.**
—, hygromycin B 66a, **71b.**
—, iodine solution **203b.**
—, lead arsenate **97a.**
—, M & B 2948A **141e.**
—, miracil-D **222x.**
—, Neguvon **210a, 211c.**
—, Nematox 777 & lindane **189b.**
—, nitrated aluminium naphtholate **141c.**
—, organic halogen compounds **206ba.**
—, *Papaya carica* latex **222cn.**
—, phenothiazine **8d, 17a, 69a, 72f, 184c, 203o.**
—, —, effect of particle size & purity **17b.**
—, piperazine **51a, 72f.**
—, — adipate **123c.**
—, — citrate **38a, 40b,** 131e.
—, polymethylenepiperazine **8b.**
—, potassium antimony dimercaptosuccinate **222k.**
—, pumpkin seed preparations **203ca.**
—, Ruelene 126a.
—, sodium antimony gluconate **222k.**
—, — pyrocatechol antimony disulphonate **222k.**
—, — silicofluoride **69c.**
—, stibophen **141f.**
—, symmetrical bis-isoquinolinium compounds **222bp.**
—, TWSb **121b, 222u, 222bh.**
—, technique for testing against *Schistosoma mansoni* **222x.**
—, tetrachlorethylene **184a, 185a.**
—, — & piperazine **185c.**
—, various **96b,** 115d.
—, —, effect on ova & larvae in faeces **206be.**
—, —, tested **34a, 184b, 196f, 203cu.**
—, vitamin E **222cs.**
Anura, see also Frog, generic & group names.
—, helminths in **219c.**
Apatemon gracilis pellucidus in *Eucalia inconstans* in North America, first record & life-history **200a.**
Aphelenchoides spp., general account **198h.**
— *besseyi* in rice, resistant varieties **48f.**
— — — — seed, treatment **48e.**
— *oryzae* in rice seed, control **203bh.**
— *panaxi* n.sp. in *Panax ginseng* in Russia **206bu.**
— *parietinus* in *Panax ginseng* in Russia **206bu.**
Aphelenchus avenae controlling *Pythium arrhenomenes* on maize **49r.**
Apocreadium angustum n.sp. in *Lactophrys trigonus* **207a.**
— *bravoi* n.sp. in *Balistes naufragium* **207a.**
— *coili* n.sp. in *Balistes* spp. **207a.**
— *uroproctoferum* n.sp. in *Balistes vetula* **207a.**
Apodemus flavicollis, Thominx sadovskajae n.sp. in **203br.**
Aporcelaimus, morphology **46a.**
— *mamillatus* n.sp. **46a.**
Apple, *Paratylenchus amblycephalus* n.sp. in **43b.**
Aprocta caprimulgi var. *madagascariensis* n.var. in *Caprimulgus madagascariensis* **10d.**
— *dogieli* synonym of *Gastrotaenia cygni* **206n.**
— *fiorii* n.sp. in *Caprimulgus madagascariensis* **10d.**
— *papillosa* n.sp. in *Centropus toulou* **10d.**
— *skrjabini* n.sp. in *Phoenicurus p. phoenicurus* in Russia **203bm.**
Aproctella milloti n.sp. in *Pterocles personatus* **10d.**
Arostellina redefined **203co.**
— *reticulata,* morphology **203co.**
Arthropods, see Animals, Crustaceans, generic & group names.
Ascariasis & amoebiasis in man 222cp.
—, epidemiology **203by.**
— in man, Alcopar 115c.
— — —, effect on serum proteins **80a.**
— — —, surgery 39a.
— — —, surgical complications 110d.
Ascarid antigens, haemagglutination & flocculation tests **144a.**
— cuticle, histology **130bg.**
— larvae in rat, state of nervous system affecting infection **203cg.**
— —, technique for determining viability of **203bz.**
Ascaridia in fowl, Atonin **206bg.**
— — —, ditrazine **206bg.**
— — —, sodium silicofluoride **69c.**
— spp. in turkeys in Russia 196c.
— *galli,* α-amylase **59c.**
— —, anthelmintics tested against *in vitro* **184b.**
— — in fowl, benzine **60a.**
— — — —, life-history, immunity & treatment **96b.**
— — — —, phenothiazine **184c.**
— — — —, tetrachlorethylene **184a.**
— — — fowl's egg **90a.**
— — ova, effect of irradiation on development **130bn.**
Ascarids & bacteria of pig & horse, interrelationship **137a.**
—, *Ficus* spp. latex tested against *in vitro* **222cn.**
—, *Papaya carica* latex tested against *in vitro* **222cn.**
Ascaris extract in mouse, effect of immunization with human erythrocytes **55a.**
— & hepatitis in pig **194a.**
— — intestinal obstruction in man 132a.
— in man, *Carica papaya* seed ineffective **38a.**
— — —, piperazine citrate **38a.**
— — —, vitamin E **222cs.**
— not killed by dithiazanine *in vitro* **131b.**
— ova, effect of irradiation **130bf.**
— in pig, effect on weight gains **18a.**
— — — in Hungary **153e.**
— toxins in dog, experimental **209a.**

Ascaris arcuata synonym of *Porrocaecum depressum* **158a.**
— *hystrix* Diesing, 1851 to *Paratractis* n.g. **40c.**
— *lumbricoides*, electron transport system **106a.**
— —, general account **167a.**
— — in mouse, piperazine citrate **40b.**
— — ova, chemicals tested against **1b.**
— — —, development & viability **59d.**
— — var. *suum*, structure of ovary & oviduct **35r.**
— *mosgovoyi* n.sp. in *Rangifer tarandus* in Russia **203dh.**
— *picae* to *Porrocaecum picae* n.comb. **158a.**
— *suum* in pig, experimental **8a.**
— *tarbagan* in mouse, localization in liver **203bq.**
Ascarops strongylina in pig, development **130ba.**
Asellus aquaticus, intermediary for *Filicollis anatis* **206b.**
Aspiculuris tetraptera, host specificity & age resistance **36c.**
— — in mouse, sex resistance **36d.**
Aspius aspius, *Diplozoon pavlovskii* on **79d.**
Astiotrema trituri n.sp. in *Triturus vulgaris*, life-history **21a.**
Asymphylodora progenetica in *Bithynia tentaculata* in Russia **203bj.**
Athene noctua, *Microtetrameres* sp. in **130g.**
Atylenchidae n.fam. **1d, 203ch.**
Atylenchinae n.subf. **1d, 203ch.**
Australorbis, nomenclature **42j.**
— *glabratus*, biology 222q, 222z.
— — controlled by *Marisa cornuarietis* **7g.**
— —, ecology **222s.**
— —, physiology **222d.**
— — in Puerto Rico, ecology **127a, 127b.**
— —, *Schistosoma mansoni* in **110e.**
Avena sp., *Meloidogyne* spp. in **48b.**
Avocado, *Pratylenchus vulnus* in **212a.**
Axonolaimus drachi n.sp. **102a.**

Bacteria & viruses, transmitted by helminths **130bk.**
Balistes spp., *Apocreadium coili* n.sp. in **207a.**
— —, *Stephanostomum provitellosum* n.sp. in **207a.**
— *capriscus*, *Pseudocreadium biminensis* n.sp. in **207a.**
— *naufragium*, *Apocreadium bravoi* n.sp. in **207a.**
— *vetula*, *Apocreadium uroproctoferum* n.sp. in **207a.**
Banana, *Radopholus similis* in **107a.**
Bats, see also generic names.
—, *Lecithodendrium hovorkai* n.sp. in **130d.**
Bean, see also *Phaseolus*.
—, *Meloidogyne incognita* & bacterial wilt in **49b.**
Beet, see also Sugar-beet.
—, *Ditylenchus dipsaci* in **164a.**
—, *Heterodera schachtii* in 213b.
Belonolaimus gracilis in crop plants, Nemagon **48h.**
— *longicaudatus* in cotton **49e.**
— — — peanut **49e.**
— — — plants, population increases in different hosts **49f.**
Benthophilus stellatus, *Ligula pavlovskii* n.sp. in **79e.**
Beta patellaris, *Heterodera schachtii* in **42k.**
Bianium lecanocephalum synonym of *Diploproctodaeum haustrum* **207a.**
Bibliography, parasitology 221.
Bidentostomum ivaschkini in equines, morphology **203cw.**
Biochemistry, see also Chemistry, Physiology.
—, *Dictyocaulus* spp. ova & larvae **103a.**
—, helminth cuticle **103b.**
—, *Metastrongylus elongatus* ova & larvae 103a.
Biography, Wiśniewski, W. L. 73a.
Biology, *Alaria* **203cr.**
—, *Australorbis glabratus* 222q, 222z.
—, cestode larvae **130w.**
—, cestodes in fowl **96a.**
—, *Dictyocaulus filaria* **206bn.**
—, *Ditylenchus dipsaci* **35f.**
—, *Galba truncatula* **1f.**
—, *Haemonchus contortus* **47a.**
—, *Heterodera glycines* **48k, 48o.**
—, — *schachtii* 24a, **43w.**
—, *Ityogonimus lorum* **47g.**
—, — *ocreatus* **47g.**
—, *Omphalometra flexuosa* **47g.**
—, *Pratylenchus brachyurus* **48i.**
—, — *penetrans* & *Tylenchorhynchus martini* **48p.**
—, — *zeae* **48i.**
Biomphalaria, nomenclature **42j.**
Bionomics, see also Ecology, Physiology.
—, eelworms in soil **78a.**
—, hookworm **146a.**
—, *Nematodirus* spp. larvae **72k, 72m.**
—, *Paragonimus* metacercaria **165a.**
Birds, see also Animals, Poultry, generic & group names.
—, cestodes in **84c, 203ct.**
—, *Diplotriaena affinis* in **130g.**
—, filariids in **10d, 130i.**
—, helminths in **37a, 203cs, 219e.**
—, microfilariae in **40d.**
—, — of **222bs.**
—, nematodes in **219a.**
—, *Porrocaecum* spp. in **158a.**
—, trematodes in **203 l.**
—, aquatic, helminths in **196d.**
Bithynia leachi, *Opisthorchis felineus* in **130v.**
— *tentaculata*, *Asymphylodora progenetica* in **203bj.**
— —, 1st intermediary for *Plagiorchis arcuatus* **206d.**
Biuterina rectangula to *Paruterina rectangula* n.comb. **203ct.**
Biuterinidae synonym of Paruterininae **130r.**
Bivesicula tarponis n.sp. in *Megalops atlanticus* **40i.**
Blaps halophila, intermediary for *Gongylonema problematicum* **203bc.**
Bolbella teisseri n.sp. **102a.**
Bolbolaimus pellucidus to *Chromaspirina pellucida* n.comb. **102a.**
Bolborhynchoides non.nov. for *Bolborhynchus* **203g.**
— *exiguus* n.comb. for *Bolborhynchus exiguus* **203g.**
Bolorhynchus to *Bolborhynchoides* nom.nov. **203g.**
— *exiguus* to *Bolborhynchoides exiguus* n.comb. **203g.**
Borneo, see also Indonesia.
—, nematodes in *Varanus* spp. **28a.**
Brama raii, *Köllikeria filicollis* in **47b.**
Brazil, see also Americas.

Brazil, eelworms in gloxinia **180b.**
—, *Physaloptera praeputialis* **58a.**
—, *Radopholus similis* **107a.**
—, *Schistosoma mansoni* **109a, 131d.**
—, schistosomiasis **222ba.**
—, *Schrankiana formosula* n.sp. **104a.**
—, *Turgida turgida* **58a.**
—, *Wuchereria bancrofti* **222cd.**
Britain, see also Northern Ireland.
—, *Fasciola hepatica* **19c.**
—, fascioliasis **19d.**
—, fascioliasis & "black disease" **72c.**
—, *Gyrodactylus callariatis* **42c.**
—, *Heterodera rostochiensis* **198j.**
—, *Ityogonimus lorum* **47g.**
—, — *ocreatus* **47g.**
—, nematology **198a.**
—, *Omphalometra flexuosa* **47g.**
—, visceral larva migrans **15a.**
British Solomon Islands, see also Pacific Islands.
— — —, *Microfilaria bruuni* n.sp. **217.**
Brugia n.g. for *Wuchereria malayi, W. pahangi* & *W. patei* 222bo.
Bucephalus markewitschi in *Lucioperca lucioperca*, first record **206q.**
Buffalo, see also Animals domestic, Ruminants.
—, *Parafilaria* sp. in **33d.**
Bulinus truncatus, intermediary for *Schistosoma haematobium* in Sudan **222f.**
— *ugandae*, intermediary for *Schistosoma bovis* in Sudan **222f.**
Bunonema estonicum n.sp. in potato in Estonia **43q.**
— (*Rhodolaimus*) *estonicum* n.sp. in potato in Estonia **43q.**
Bunostomum phlebotomum in cattle, effect on blood & liver copper **16a.**

Cableia trigoni n.g., n.sp. in *Lactophrys trigonus* **207a.**
Caenorhabditis briggsae, technique for studying nutrition of **198v.**
Calcaronema n.g., **130 l.**
— *phenisci* n.comb. for *Cyathostoma phenisci* **130 l.**
— *trifurcatum* n.sp. in *Ciconia nigra* **130 l.**
— *verrucosum* n.sp. in *Ciconia ciconia* **130 l.**
Calicophoron calicophorum in cattle in Russia **130c.**
— *erschowi* n.sp. in cattle in Russia **130c.**
Calicotyle kroyeri in *Raja radiata*, discussed **42h, 42i.**
Calidris alpina, Echinocotyle paranitidulans n.sp. in **219e.**
Callichrous pabda, Sprostonia asiatica n.sp. on **47h.**
Calliobothrium verticillatum, urea content & osmotic properties **36g.**
Cameroons, see also Africa, Nigeria, West Africa.
—, *Acanthocheilonema perstans* **160b.**
—, onchocerciasis **160b.**
—, *Radopholus lavabri* **192a.**
Canada, see also Americas, North America.
—, eelworms in plants **26a.**
—, *Heterodera trifolii* **43v.**
Canines, see also Dog, Fox, Mammals, generic names.
—, *Diphyllobothrium latum* in **130z.**
Canis latrans, helminths in **197a.**
Capella spp., *Plagiorchis ovoidalis* n.sp. in **203bo.**
— *stenura, Anomotaenia ancora* n.sp. in **203bo.**
— —, *Pseudapatemon tiaratus* n.sp. in **203bo.**
Capillaria spp. in *Rangifer tarandus*, first record **205a.**
— *alpina* n.sp. in *Tetrao urogallus* & *Lyrurus tetrix* **18c.**
— *rangiferi* n.sp. in *Rangifer tarandus* **205a.**
Capra ibex, lungworms in **123b.**
Capreolus capreolus, helminths in **70a.**
Caprimulgus madagascariensis, Aprocta caprimulgi var. *madagascariensis* n.var. in **10d.**
— —, — *fiorii* n.sp. in **10d.**
Cardiofilaria skrjabini Petrov & Chertkova, 1947 to *Ornithofilaria skrjabini* n.comb. **10b.**
Cardionematinae to Metastrongylidae **10c.**
Caribbean, see also Central America, Gulf of Panama, West Indies.
—, Digenea **207a.**
Carinema ardae Mawson, 1957 to *Pseudaproctella ardae* n.comb. **10b.**
— *graucalinum* Johnston & Mawson, 1940 to *Pseudaproctella graucalinum* n.comb. **10b.**
Carrot, see also Vegetables.
—, eelworms not causing "Staartpeen" in **68e.**
Castor fiber, Trichostrongylus axei in **206s.**
Cat, see also Animals domestic, Mammals.
—, *Aelurostrongylus abstrusus* in **67c.**
—, cestodes in 138a.
—, helminths in **59b, 151b, 203cu.**
—, *Opisthorchis* in **195c.**
—, *Wuchereria malayi* in **13f.**
Cattle, see also Animals domestic, Buffalo, Ruminants, Zebu.
—, ascaridole aerosol **199c.**
—, *Bunostomum phlebotomum* in **16a.**
—, *Calicophoron calicophorum* in **130c.**
—, — *erschowi* n.sp. in **130c.**
—, carbon tetrachloride **69e, 84e.**
—, — — affecting plasma histamine **130bm.**
—, — — excretion in milk **84j.**
—, cyanacethydrazide **72j, 199c.**
—, — & phenothiazine **199b.**
—, cysticerciasis in **194d,** 215d.
—, *Cysticercus bovis* in **13c.**
—, *Dictyocaulus viviparus* in **19b, 72g.**
—, fascioliasis in **93c, 203v.**
—, helminths in **189a.**
—, hexachlorophene **67b.**
—, hydatid in 93a, 93b.
—, lungworms in **20a.**
—, nematodes in **17a, 63a.**
—, paramphistomiasis in **130bh.**
—, phenothiazine **17a.**
—, piperazine adipate **123c.**
—, Ruelene 126a.
—, *Stephanofilaria* & summer sores in **34b.**
—, *Thelazia* in **209b.**
—, — spp. in **128a, 203bb.**
—, toxicity of Freon-112 to **206bd.**
—, — — hexachlorethane to **72e.**
Central America, see also Americas, specific territories.
— —, onchocerciasis **222bd.**
Centropus toulou, Aprocta papillosa n.sp. in **10d.**

Cephalogonimus americanus in *Rana pipiens* in Costa Rica, first record **182a.**
Cercaria n.sp. in *Pisidium amnicum* **219d.**
— 12 n.spp. in snails in U.S.A. [nomina nuda] **35b.**
— *abyssalis* n.sp. in *Valvata piscinalis* **219d.**
— *contorti* n.sp. in *Anisus contortus* **219d.**
— *gracilis* Wesenberg-Lund, 1934 to *C. pseudogracilis* nom.nov. **1c.**
— *natrouni* n.sp. in *Lymnaea stagnalis* **142a.**
— *neustica* & *Mosesia chordeilesia* identical **35b.**
— *pilosa* n.spp. in *Coretus corneus* **1c.**
— *pseudogracilis* nom.nov. for *C. gracilis* Wesenberg-Lund, 1934 **1c.**
— *robinsonensis* n.sp. in *Physa gyrina* **162a.**
— *spinulosa* n.sp. in *Lymnaea stagnalis* **219d.**
— *valvatae* n.sp. Ginetsinskaya, 1959 in *Valvata piscinalis* **219d.**
— — — — Lal, 1959 in *Valvata piscinalis* **42f.**
— *vilanoviensis* n.sp. in *Coretus corneus* **1c.**
— *X in Gasterosteus aculeatus*, penetration & migration **47j.**
Cercariae in *Coretus corneus* in Poland **1c.**
— — fresh-water molluscs in Russia, new records **219d.**
— — — snails in Germany **76d.**
Cercariaeum pereger n.sp. in *Radix pereger* **219d.**
Cercarial dermatitis in man **130bc.**
Cereals, see also Gramineae, Maize, Plants, Rice.
—, eelworms in **49g, 49s.**
—, *Heterodera avenae* in **198k, 203bp.**
Cervus spp., *Elaphostrongylus* in **203bl.**
— —, *Setaria* in **203bl.**
Cestode larvae, see also generic names of adults & group names of larval stages.
— — in copepods, host-parasite relationships **130w.**
— — — sheep in Russia, control 195a.
Cestodes in Anseriformes in Russia **203cc.**
— — birds in Russia **84c, 203ct.**
— — cat & dog, popular account 138a.
— — dog, aminoacrichin & carbochol **206bh.**
— — —, filixan **206bh.**
— — duck & goose, filixan **196b.**
— — fowl, anthelmintics tested **34a, 196f.**
— — —, biology & life-history **96a.**
Ceuthophilus spp., intermediary for *Rictularia coloradensis* **35n.**
Chad, see also Africa.
—, *Cysticercus bovis* **188a.**
—, — *dromedarii* **188a.**
—, helminths in animals **188b.**
Chaetodipterus lippei, Lasiotocus chaetodipteri n.sp. in **40h.**
Charadriiformes, see also Birds, generic names.
—, helminths in **203bn, 219b.**
Chelone mydas, Cymatocarpus undulatus in **89a.**
Chemistry, see also Biochemistry, Physiology.
—, helminth antigens **206j.**
—, *Oncomelania nosophora* **7a.**
China, see also Far East, Formosa, Mongolia.
—, onchocerciasis **30b.**
Chromaspirina parapontica n.sp. **102a.**
— *pellucida* n.comb. for *Bolbolaimus pellucidus* **102a.**
Chrysemys picta belli, Spirorchis elegans in **170a.**
— — —, — *pseudemyae* in **170a.**
Chrysemys p. picta, Spirorchis elegans in **35m.**
Chrysonema mauritiana n.sp. **46a.**
Ciconia ciconia, Calcaronema verrucosum n.sp. in **130l.**
— —, *Oschmarinolepis microcephala* in **130n.**
— *nigra, Calcaronema trifurcatum* n.sp. in **130l.**
Cinchona succirubra, Criconema limitaneum n.sp. on **43c.**
Citrus, see also Fruit trees.
—, eelworms & decline in **33b.**
—, *Radopholus similis* in **48q, 49d, 49v.**
—, — — & spreading decline in **49m.**
Clangula hyemalis, Amidostomum orientale n.sp. in **130h.**
— —, *Wardium nyrocae* n.sp. in **203cc.**
Clemmys insculpta, Dictyangium chelydrae in **201a.**
Clethrionomys spp., *Heligmosomum petrovi* n.sp. in **84a.**
— *glareolus, Thominx sadovskajae* n.sp. in **203br.**
— *rutilus, Rictularia sibiricensis* n.sp. in **203br.**
Clinostomum metacercariae in *Trichogaster fasciatus* in India **33a.**
Cloacitrema deltoida n.sp. in *Tringa incana* in Russia **203bo.**
Clonorchiasis in man in Korea **117a.**
Clonorchis sinensis antigen, technique for preparing **36f.**
— — in laboratory animals **35q.**
— — — man **166b.**
— — — —, diagnosis by intradermal tests **5a.**
— — metacercariae, survival **35q.**
— — in rabbit, production of ova **40g.**
Clover, red, *Meloidogyne incognita* in **49q.**
—, —, — — var. *acrita* in **49q.**
—, —, *Pratylenchus penetrans* & *Tylenchorhynchus martini* on **48p.**
—, white, *Meloidogyne incognita* in **49q.**
—, —, — — var. *acrita* in **49q.**
Coenurus in sheep in New Zealand **45a.**
— — — — — —, control **44a.**
— — —, surgery **195d.**
Colocasia antiquorum, Meloidogyne javanica in **33c.**
Colymbus spp., helminths in **29f.**
— *caspicus caspicus, Parafimbriaria websteri* in **130n.**
Control, see also Anthelmintics, Molluscicides, Nematicides (plant eelworm), Treatment.
—, *Aphelenchoides oryzae* **203bh.**
—, *Ascaris* ova **130bf.**
—, — *lumbricoides* **1b.**
—, *Australorbis glabratus* **7g.**
—, cestode larvae 195a.
—, *Coenurus* **44a.**
—, *Ditylenchus destructor* **49i.**
—, — *dipsaci* **35f, 203cz, 206bv.**
—, eelworms **198q.**
—, — in plants **2b, 4a, 49o, 65b, 203bf,** 213j.
—, — — potato **112a.**
—, — — soil **49w.**
—, fascioliasis **203v.**
—, filariasis **222bj.**
—, helminth ova **122a.**
—, helminths 203de.
—, — in cattle & sheep **189a.**
—, helminths in domestic animals 203dg.
—, *Heterodera glycines* **48a.**
—, — *major* **68a.**

Control, *Heterodera rostochiensis* **43s, 203cf,** 213f, **216a.**
—, — *schachtii* 24a, **43w,** 213b.
—, hookworms **203cx.**
—, hydatid 32a, **44a.**
—, hydatidosis 44c.
—, *Meloidogyne hapla* **178a.**
—, — *incognita* var. *acrita* **48d.**
—, nematodes in cattle & sheep **63a.**
—, *Nematodirus* spp. **3a.**
—, onchocerciasis **13e, 117b.**
—, *Radopholus similis* **49d.**
—, schistosome intermediaries **222g.**
—, schistosomiasis **222ba.**
—, — mansoni **7g.**
—, Simuliidae **65c.**
—, *Simulium* spp. **117b.**
—, — *damnosum* **222bi.**
—, *Thelazia* spp. **203bb.**
—, *Wuchereria bancrofti* **222cd.**
Convallaria majalis, Pratylenchus convallariae n.sp. in **43 l.**
Copepods, see also Crustaceans, generic & group names.
—, cestode larvae in **130w.**
Coretus corneus, Cercaria pilosa n.sp. in **1c.**
— —, — *vilanoviensis* n.sp. in **1c.**
— —, 1st intermediary for *Astiotrema trituri* **21a.**
Cosmocercoides dukae in *Deroceras gracile*, life-history **173a.**
Costa Rica, see also Central America.
— —, *Cephalogonimus americanus* **182a.**
— —, *Glypthelmins facioi* n.sp. **182a.**
— —, *Megalodiscus temperatus* **182a.**
Cotton, *Belonolaimus longicaudatus* in **49e.**
—, *Meloidogyne* in **49k.**
—, — sp. in **49j.**
—, *Rotylenchulus reniformis* in **49e.**
Cowpea, *Meloidogyne* spp. in **48 l.**
Creeping eruption, see also Hookworm, Larva migrans.
— — in man, treatment **14a.**
Crepidostomum nemachilus n.sp. in *Nemachilus barbatus toni* in Russia **84a.**
Cricetulus barabensis griseus, Viannella chinensis n.sp. in **29e.**
Criconema limitaneum n.sp. on *Cinchona succirubra* **43c.**
Criconemoides ferniae n.sp. on *Ananas sativus* **43c.**
— *onoense* n.sp. on *Ananas sativus* **43c.**
Crustaceans, see also generic & group names.
—, acanthocephalan larvae in **219f.**
Ctenopharyngodon idella, Amurotrema dombrowskajae n.g., n.sp. in **203h.**
Ctenosaura similis similis, Ozolaimus cirratus in **89d.**
Cucurbitaceae, see also Plants, generic names.
—, *Meloidogyne* spp. in **49u.**
Culex fatigans transmitting *Wuchereria bancrofti* **13d.**
— —, *Wuchereria bancrofti* in **133c.**
Cyathostoma phenisci to *Calcaronema phenisci* n.comb. **130 l.**
Cyclopids, see also Copepoda, Crustaceans, generic names.
—, *Fimbriaria amuriensis* n.sp. [nom.nud.] larva in **196e.**
Cyclopids, intermediary for *Drepanidotaenia przewalskii* **196e.**
Cyclops, *Drepanidotaenia lanceolata* in **203q.**
— spp., *Triaenophorus lucii* & *Drepanidotaenia lanceolata* in 79h.
Cygnus bewickii, helminths in **203cb.**
— *olor, Nematoparataenia skrjabini* n.sp. in **206n.**
Cylicodontophorus mongolica in equines, morphology **203cw.**
Cylindrocorpus goodeyi n.sp. **43k.**
— (*Cylindrocorpus*) n.subg. **43k.**
— (*Protocylindrocorpus*) *goodeyi* n.subg., n.sp. **43k.**
Cymatocarpus undulatus in *Chelone mydas*, morphology & synonymy **89a.**
Cynoglossus goreensis, Diplomonorcheides magnacetabulum n.g., n.sp. in **40h.**
— —, *Lasiotocus cynoglossi magniovatus* n.sp., n.subsp. in **40h.**
Cyprinus carpio, Allocreadium carparum n.sp. in **76b.**
Cypseliformes, see also Birds, generic & group names.
—, dilepidids in **130j.**
Cysticerciasis in cattle in Czechoslovakia **194d.**
— — — — Libya 215d.
— of central nervous system in man, diagnosis **203n.**
—, cerebral, in man 50a, 110f.
— in man **52a.**
— — —, serological diagnosis **166c.**
— — pig, histology of heart muscle **130bj.**
Cysticercus bovis in animals in Chad **188a.**
— — — cattle, detection **13c.**
— *cellulosae* in pig, X-ray diagnosis **18e.**
— *dromedarii* in animals in Chad **188a.**
Cytology, *Fasciola hepatica* **174a.**
—, *Haplometra cylindracea* **174a.**
—, *Helicotylenchus* spp. **43m.**
—, helminths **40a.**
—, *Heterodera avenae* **43a.**
—, — *rostochiensis* **42a.**
Czechoslovakia, cysticerciasis **194d.**
—, *Dactylogyrus* spp. **29d.**
—, *Gyrodactylus* spp. **29c.**
—, helminths in *Colymbus* spp. **29f.**
—, — — fresh-water fish **214a.**
—, — — insectivores **29j.**
—, hydatid **128c.**
—, *Lecithodendrium hovorkai* n.sp. **130d.**
—, lungworms **60c.**
—, *Metagonimus yokogawai* **130k.**
—, *Metastrongylus* spp. **128b,** 130bp.
—, nematode larvae **122b.**
—, nematodes in turkeys **130b.**
—, *Thelazia* spp. **128a.**
—, trematodes in fish **60d.**

Dactylogyrus spp. on fresh-water fish in Czechoslovakia **29d.**
— —, morphology **60d.**
— *hemiamphibothrium*, morphology **29d.**
Dendritobilharzia anatinarum synonym of *D. pulverulenta* **130o.**
— *pulverulenta* in *Anas querquedula*, morphology & synonymy **130o.**

Dendrouterina karajasicus n.comb. for *Lateriporus karajasicus* **130n.**
Deroceras gracile, *Cosmocercoides dukae* in **173a.**
Desmana moschata, helminths in **203be.**
Desmodora roscoffiensis n.sp. **102a.**
Development, see also Embryology, Life-history.
—, *Amidostomum anseris* **84f.**
—, *Ascaris lumbricoides* ova **59d.**
—, *Ascarops strongylina* **130ba.**
—, *Fasciola hepatica* **130t.**
—, *Haemonchus contortus* **47a.**
—, helminth ova **130y.**
—, *Heterodera trifolii* **43y.**
—, *Hymenolepis nana* **36j.**
—, — — ova **156a.**
—, *Meloidogyne hapla* **43e.**
—, — *javanica* **43e.**
—, *Opisthorchis felineus* **130v.**
—, *Ostertagia ostertagi* **130s.**
Diagnosis, *Clonorchis sinensis* **5a.**
—, cysticerciasis **166c, 203n.**
—, *Cysticercus cellulosae* **18e.**
—, dictyocauliasis **203bx.**
—, *Fasciola hepatica* **88a.**
—, hydatid **7e, 7f, 7i, 35c.**
—, paragonimiasis **222cm.**
—, *Paragonimus westermani* **5a.**
—, *Schistosoma* **88a.**
—, — *mansoni* 161a.
—, *Trichinella* **59a, 122b.**
—, tropical eosinophilia **7k.**
—, visceral larva migrans **222ck.**
Dicranotaenia collaris to *Myxolepis* n.g. **79a.**
Dicrocoelium, see also Liver-fluke.
— in sheep, hetrazan ineffective **128d.**
— *dendriticum* in laboratory animals, larval migration **69b.**
— — — man in France 145a.
Dictyangium chelydrae in *Clemmys insculpta* in U.S.A., first record **201a.**
Dictyocauliasis in cattle, ascaridole aerosol **199c.**
— — —, cyanacethydrazide **199c.**
— — ruminants, serological diagnosis **203bx.**
— — sheep, treatment **203p.**
Dictyocaulus larvae, survival on pasture **203v.**
— in sheep, cyanacethydrazide **153b.**
— — —, haematology **206bm.**
— — —, phenothiazine as prophylactic **69a.**
— spp. ova & larvae, biochemistry & development **103a.**
— *arnfieldi* in horse, ditrazine ineffective **206y.**
— — — — —, iodine solution **203b.**
— *filaria*, hyaluronidase demonstrated **130bl.**
— — in sheep, biology, pathogenicity & economic loss **206bn.**
— — — — —, effect of superinfection **203j.**
— — — — —, pathology **206bp.**
— *viviparus* in cattle, irradiated larvae conferring immunity **19b, 72g.**
Dictyocotyle coeliaca in *Raja radiata*, discussed **42h, 42i.**
Digenea, see also Trematodes.
— in fish in Pacific, morphology & new records **89c.**
— — marine fish in Caribbean & Gulf of Panama, new records **207a.**
— — — — — — U.S.A., new records **171a.**
Dilepidids in Cypseliformes & Passeriformes **130j.**
Dipetalonema reconditum in dog, general account **71a.**
Dipetalonematidae to Onchocercidae nom.nov. **10c.**
Diphyllobothrium anaemia in man, Schilling test **92a.**
— in fur-bearing animals in Russia **206h.**
— — man in Finland **91a.**
— — —, treatment 186h.
— *latum* in canines, life-history **130z.**
— — — *Perca fluviatilis* & *Esox lucius*, histopathology **123a.**
— —, uptake of vitamin B_{12} & viability of ova **92b.**
— — & vitamin B_{12} deficiency in man **222cf.**
Diplangus macrovitellus n.comb. for *Proctoeces macrovitellus* **89c.**
Diplodiscus subclavatus in frogs in Europe **76c.**
Diplomonorcheides magnacetabulum n.g., n.sp. in *Cynoglossus goreensis* **40h.**
Diploproctodaeum haustrum, synonymy **207a.**
Diplotriaena affinis in birds in Russia **130g.**
— *manipoli* in Russia, first record **219a.**
— *nagpurensis*, morphology **175a.**
Diplozoon homoion on *Rutilus rutilus* **79d.**
— *megan* on *Leuciscus idus* **79d.**
— *pavlovskii* on *Aspius aspius* **79d.**
Dirofilaria spp., synonymy **111a.**
— *immitis* antigen in diagnosis of tropical eosinophilia **7k.**
— — antigens **222br.**
— — in dog, agglutination of microfilariae in blood **22cb.**
— — — —, general account **71a.**
— *striata* in *Felis* spp., morphology **111a.**
Distomum soleare synonym of *Cymatocarpus undulatus* **89a.**
Ditrachybothridium macrocephalum n.g., n.sp. in *Raja* spp. & *Scyliorhinus caniculus* **47k.**
Ditylenchus, morphology & host-parasite relationships **198c.**
— in soil, treatment 213c.
— *destructor* in plants in Netherlands, host list **68b.**
— — — potato 213i.
— — — — —, mode of spread **130u.**
— — — — — in Russia **204a.**
— — — — —, treatment & control **49i.**
— —, technique for diagnosing in potato **213d.**
— *dipsaci* attracted by carbon dioxide **157a.**
— — in beet in Germany **164a.**
— — — onion, biology & control **35f.**
— — — — —, control **206bv.**
— — on plants, races & host preference **48g.**
— — in plants, symptoms **198d.**
— — — strawberry, control **203cz.**
— — of sugar-beet on weeds, pathology **43x.**
— —, technique for culturing **198d.**
— *phloxidis*, effect of parathion **203u.**
Dog, see also Animals domestic, Canines.
—, aminoacrichin & carbochol **206bh.**
—, *Ancylostoma caninum* in **35p.**
—, *Ascaris* toxins in **209a.**
—, cestodes in 138a.
—, *Dipetalonema reconditum* in **71a.**

Dog, *Dirofilaria immitis* in **71a, 222cb.**
—, *Echinococcus granulosus* in **28c, 35c, 130bb.**
—, filixan **206bh.**
—, helminths in **59b, 206m.**
—, Neguvon **211c.**
—, *Opisthorchis* in **195c.**
—, *Phagicola longicollis* in **76a.**
—, *Spirocerca lupi* in 81a.
—, trematodes in **76a.**
Dolichodoridae n.fam. **1d, 203ch.**
Dollfustrema muraenae n.sp. in *Gymnothorax vicinus* **207a.**
Dorosoma cepedianum, *Mazocraeoides olentangiensis* n.sp. on 35h.
Dorylaimus, morphology 46a.
— *flagellatus* n.sp. **46a.**
— *sylphoides* n.sp. **46a.**
Dracontiasis in man in India 134a.
Dragon-flies, see also generic names.
—, 2nd intermediary for *Plagiorchis arcuatus* **206d.**
Drepanidotaenia lanceolata in Cyclops **203q.**
— — & *Triaenophorus lucii* in *Cyclops* spp., interspecific relationship 79h.
— *przewalskii* in duck & goose, first record **206v.**
— —, life-history **196e.**
Drosophila spp., *Howardula aoronymphium* n.sp. in **47d.**
— —, *Parasitylenchus diplogenus* n.sp. in **47d.**
Duck, see also Poultry.
—, carbon tetrachloride **69f.**
—, *Drepanidotaenia przewalskii* in **206v.**
—, *Echinuria uncinata* in **194c.**
—, *Filicollis anatis* in **206b, 206bo.**
—, filixan **196b.**
—, helminths in **196e.**
—, *Hystrichis tricolor* in **203bd.**
—, *Porrocaecum crassum* in **206bi.**
—, *Tetrameres fissispina* in **194c.**

Earthworms, see also generic names.
—, intermediary for *Hystrichis tricolor* **203bd.**
—, — — *Porrocaecum heteroura* **130x.**
East Africa, see also Africa, specific territories.
— —, *Wuchereria bancrofti* **13d.**
Echinochasmus perfoliatus in *Rattus norvegicus*, first record **70b.**
Echinococcus speciation **222cj.**
— *granulosus* in dog & fox, experimental **130bb.**
— — — — in U.S.A. **35c.**
— — — — — West Pakistan **28c.**
— — reviewed **211b.**
— *multilocularis* & alveolar hydatid, discussed **222cl.**
— — reviewed **211b.**
Echinocotyle paranitidulans n.sp. in *Calidris alpina* in Russia **219e.**
Echinoparyphium petrowi in *Viviparus viviparus* in Russia **203bj.**
— *spiniferum*, life-history **76d.**
Echinostoma paraulum in *Radix auricularia*, first record **196e.**
— *revolutum* in *Semisulcospira cancellata*, first record **196e.**
Echinuria in duck, carbon tetrachloride **69f.**
— *uncinata* in duck, symptoms & pathology **194c.**
Ecology, see also Bionomics.
—, *Australorbis glabratus* **127a, 127b, 222s.**
—, eelworms in Gramineae **130a.**
—, — — soil **127c, 203i.**
—, *Galba truncatula* **1f.**
—, helminths in *Alces alces* **203ce.**
—, — — ruminants **29a.**
—, *Heterodera schachtii* **206bt.**
—, *Mansonia annulifera* **133a.**
—, — *uniformis* **133a.**
—, oribatid mites **206g.**
—, *Pratylenchus brachyurus* **35i.**
—, — *zeae* **35i.**
—, *Schistosoma mansoni* cercariae **110e.**
Ecphyadophoridae n.fam. **1d, 203ch.**
Ecphyadophorinae n.subf. **1d, 203ch.**
Eelworm populations, technique for estimating **198m.**
Eelworms associated with sugar-cane **49 l.**
— in cereals & grasses in U.S.A. **49g.**
— — — in U.S.A. **49s.**
—, chemical control **198q.**
— in crop plants in Ghana **22a.**
— & decline in *Citrus* in India **33b.**
— in fruit trees in Italy, general account **136a.**
— — gloxinia in Brazil **180b.**
— — Gramineae in Russia, population dynamics **130a.**
— — grasses, survey **49h.**
—, movement through sand influenced by rate of flow of water **12a.**
— not causing "Staartpeen" in carrot **68e.**
— in onion & garlic, weeds as reservoirs **203cq.**
— — plants, biological control 213j.
— — — in Canada, new records **26a.**
— — —, control by irradiation impracticable **49o.**
— — —, — — nematicides **2b, 4a.**
— — —, —, popular account **65b.**
— — —, general account **2a,** 163a, 213g, 213h.
— — —, hot-water treatment **198s.**
— on plants in Ivory Coast **43c.**
— in plants in Netherlands, new records **68c.**
— of plants, physiology & evolution of parasitism **130e.**
— in plants in Russia **203bt,** 203cv.
— — — — —, control **203bf.**
— — — — U.S.A., general account **169a.**
— — potato, control **112a.**
— — soil, control by castor pomace impracticable **49w.**
— — —, ecology **127c.**
— — —, effect of environment on population **78a.**
— — — in Russia, ecology **203i.**
— — sugar-cane in Mauritius **46a.**
— — — — Puerto Rico, general account **181a.**
—, technique for extracting from plants & soil **155a.**
—, — — transferring from fixative to glycerin **43i.**
—, in vine in Italy, general account **136a.**
—, marine, in France, morphology **102a.**
Egypt, see also Africa.
—, *Lymnaea* spp. **142a.**
—, *Phagicola longicollis* **76a.**
—, schistosomiasis 222a, 222 l.
—, trematodes in dog **76a.**
Eisenia veneta var. *hortensis*, intermediary for *Metastrongylus* spp. **128b,** 130bp.

Elaphostrongylus in *Cervus* spp., localization & seasonal dynamics **203bl.**
— for *Neurofilaria cornellensis* Whitlock, 1952 **31a.**
— — — *Pneumostrongylus* of Dougherty, 1945 **31a.**
—, synonymy **31a.**
Elephant, see also Mammals.
—, Indian, *Pfenderius heterocaeca* in **135a.**
—, —, — *papillatus* in **135a.**
—, —, *Pseudodiscus hawkesii* in **135a.**
Elephantiasis in man, surgical treatment **11a.**
Embryology, see also Development, Life-history.
—, *Heterodera trifolii* **43y.**
Emys blandingi, *Spirorchis pseudemyae* in **170a.**
Enterobiasis in man, general account 183a.
Eoacanthocephala revised **10a.**
Eosinophilia, see also Haematology.
—, tropical, in man 140a.
—, —, — —, serological diagnosis **7k.**
Epidemiology, ascariasis **203by.**
—, *Filicollis anatis* **206b.**
—, helminths 203de.
—, — in man **203cy,** 222co.
—, *Moniezia* spp. **206g.**
—, trichuriasis **203by.**
Epinephelus tigris, *Lepidapedon parepinepheli* n.sp. in **207a.**
Equines, see also Animals, Horse, Mammals, generic names.
—, *Bidentostomum ivaschkini* in **203cw.**
—, *Cylicodontophorus mongolica* in **203cw.**
—, *Onchocerca* spp. & periodic ophthalmia in **130bi.**
—, onchocerciasis in **30b.**
—, *Tridentoinfundibulum gobi* in **203cw.**
Esox lucius, *Diphyllobothrium latum* in **123a.**
Estonia, see also Russia.
—, *Bunonema estonicum* n.sp. **43q.**
Eucalia inconstans, *Apatemon gracilis pellucidus* in **200a.**
Euclinostomum heterostomum ova & miracidia, morphology **23a.**
Europe, see also specific countries.
—, *Diplodiscus subclavatus* **76c.**
Euryancale marsipospora n.sp. on *Rhabditis* in U.S.A. **159a.**
Eurycercus lamellatus, 2nd intermediary for *Astiotrema trituri* **21a.**
Eurytrema media n.sp. in sheep in Russia **206w.**
Eustrongyloides sp. larva in *Pseudoplatystoma corruscans* **180a.**
Eutropiichthys vacha, *Sprostonia indica* n.g., n.sp. on **47h.**
Evolution, Acanthocephala **84d.**
—, eelworms of plants **130e.**
—, Filarioidea **222bv.**

Far East, see also specific territories.
— —, helminths in Charadriiformes **219b.**
Fasciola, see also Liver-fluke.
— ova, technique for counting **71c.**
— in pig, hexachlorethane **203cl.**
— sp. in *Lymnaea caillaudi* **142a.**
— spp., morphology **114a.**
— — in sheep, effect on vitamin A in liver **203t.**
— *gigantica* in sheep, symptoms & treatment **203s.**
Fasciola hepatica in cattle, carbon tetrachloride intramuscularly **84e.**
— — — —, hexachlorophene **67b.**
— — — lung of sheep **37b.**
— — — *Lymnaea truncatula*, development **130t.**
— — — man in Britain **19c.**
— — — —, immunological diagnosis **88a.**
— —, maturation & fertilization **174a.**
— — in rabbit in Italy **215b.**
— — — sheep, carbon tetrachloride **206bb.**
— — — —, hexachlorethane **206bb.**
Fascioliasis & "black disease" in sheep in Britain **72c.**
— in cattle, carbon tetrachloride **69e.**
— — —, control **203v.**
— — —, Freon-112 **206bd.**
— — —, haematology **93c.**
— — man in Britain **19d.**
— — ruminants, carbon tetrachloride intramuscularly **153d.**
— — sheep, difluorotetrachlorethane **203w.**
— — —, organic halogen compounds tested **206ba.**
— — —, treatment **206bc.**
Fascioloides magna, technique for culturing **35 l.**
Felis spp., *Dirofilaria striata* in **111a.**
Ferrissia tenuis, morphology **222c.**
Fibricola to *Neodiplostomum* (*Fibricola*) **47e.**
Ficus elastica var. *decora*, *Heterodera fici* in **176a.**
— — — —, *Meloidogyne arenaria* in **176a.**
Fiji, see also Pacific Islands.
—, filariasis **220.**
Filariasis & chyluria in man 54a.
— in man in Americas **222bw.**
— — — — Fiji, survey **220.**
— — — — Formosa & Pescadores Islands, survey & treatment **143a.**
— — — — India **133e.**
— — — — Indonesia **222bm.**
— — — — Malaya **222bl.**
— — —, neuro-psychiatric symptoms 116a.
— — — in Polynesia, survey & control **222bj.**
— bancrofti, see also *Wuchereria.*
— — in man in Tanganyika **222bn.**
Filariids in animals, effect of splenectomy **222bp.**
— — birds in Madagascar **10d.**
— — — — Russia, new records **130i.**
Filarioidea, evolution **222bv.**
—, revision & new classification **10c.**
Filarioids & purpura in man **222bt.**
Filicollis anatis in duck, epidemiology & life-history **206b.**
— — — —, pathology **206bo.**
Fimbriaria amuriensis n.sp. [nom.nud.] larva in Cyclopids **196e.**
Finland, *Diphyllobothrium* **91a.**
Fish, see also Animals, generic & group names.
—, Digenea in **89c.**
—, *Metagonimus yokogawai* metacercaria in **130k.**
—, trematodes in **60d.**
—, fresh-water, acanthocephalans in **203g.**
—, —, *Dactylogyrus* spp. on **29d.**
—, —, *Gyrodactylus* spp. on **29c.**
—, —, helminths in **1a, 206q, 214a.**
—, —, *Mesostephanus kentuckiensis* metacercariae in **35e.**
—, —, *Neascus cuticola* in **79c.**

Fish, marine, Digenea in **171a, 207a.**
—, —, Monogenea on **171b.**
—, —, trematodes in **40h.**
Formosa, see also China, Far East, Pescadores Islands.
—, filariasis **143a.**
—, helminths in man **7h.**
Fowl, see also Poultry.
—, anthelmintics tested **34a, 196f.**
—, arecoline **203o.**
—, *Ascaridia galli* in **96b.**
—, Atonin **206bg.**
—, benzine **60a.**
—, cestodes in **96a.**
—, ditrazine **206bg.**
—, *Heterakis gallinae* in **203db.**
—, hygromycin **105a.**
—, phenothiazine **184c, 203o.**
—, *Plagiorchis arcuatus* in **206d, 206bq.**
—, sodium silicofluoride **69c.**
—, *Syngamus* in **189b.**
—, — *skrjabinomorpha* & *S. trachea* in **203dc.**
—, tetrachlorethylene **184a.**
Fowl's egg, *Ascaridia galli* in **90a.**
Fox, see also Animals fur-bearing, Canines, generic names.
—, *Echinococcus granulosus* in **130bb.**
—, *Plagiorchis dubnicki* n.sp. in **206r.**
—, silver, benzine **193a.**
France, *Dicrocoelium dendriticum* 145a.
—, marine eelworms **102a.**
French West Africa, see also Africa, Ivory Coast, Mauritania, West Africa.
— — —, *Schistosoma haematobium* **154a.**
Frogs, see also Amphibians, Anura, generic names.
—, *Diplodiscus subclavatus* in **76c.**
Fruit trees, see also Apple, Avocado, Citrus, Peach, generic names.
— —, eelworms in **136a.**
Fulica atra, Thominx fulicae n.sp. in **130f.**
Fungi attacking eelworms, technique for isolating **48c.**
— controlling *Ancylostoma* larvae **203cp.**
— — *Meloidogyne* **203cp.**

Gadus callarias, Anisakis larvae in **47f.**
— —, *Gyrodactylus callariatis* on **42c.**
— —, *Porrocaecum* larvae in **47f.**
Galba, see also *Lymnaea.*
— *truncatula* in Poland, biology & ecology **1f.**
Galliformes, see also Birds, generic names.
—, helminths in **203bn.**
Garlic, eelworms in **203cq.**
Gasterosteus aculeatus, Cercaria X in **47j.**
Gastrotaenia cygni, morphology & synonymy **206n.**
Geotrupes stercorosus, intermediary for *Staphylocystis furcata* **1e.**
Germany, see also Europe.
—, cercariae in fresh-water snails **76d.**
—, *Ditylenchus dipsaci* **164a.**
—, helminths in animals 29b.
—, — — domestic animals **18b.**
—, — — *Lyrurus tetrix* **18c.**
—, — — *Tetrao urogallus* **18c.**
Germany, *Omphalometra flexuosa* **76b.**
—, *Porrocaecum* spp. **158a.**
—, *Stephanofilaria* & summer sores **34b.**
Gerres cinereus, Pachycreadium lerneri n.sp. in **207a.**
Ghana, see also Africa, West Africa.
—, eelworms in crop plants **22a.**
—, trematodes in marine fish **40h.**
Gloxinia, eelworms in **180b.**
Glypthelminae n.subf. **9a.**
Glypthelmins revised **9a.**
— spp. to *Margeana* **9a.**
— *africana* to *Reynoldstrema* n.g. **9a.**
— *facioi* n.sp. in *Rana pipiens* in Costa Rica **182a.**
Gnathostoma spinigerum in *Vulpes vulpes japonica*, first record **151a.**
Gnathostomiasis in man in Japan, life-history **222cr.**
Goa, see also India.
—, helminths in man 222ch.
—, *Wuchereria bancrofti* **222cc.**
Goat, see also Animals domestic, Ruminants.
—, Dipterex **30e.**
—, helminths in **203c.**
—, hydatid in **72d.**
—, *Neoascaris vitulorum* in **124a.**
—, strongyloidiasis in **8c, 40e.**
Gonacanthella lutjani n.g., n.sp. in *Lutjanus jordani* (?) **207a.**
Gongylonema problematicum in mouse, life-history **203bc.**
Goniobasis livescens, 1st intermediary for *Mesostephanus kentuckiensis* **35e.**
Goose, see also Poultry.
—, *Amidostomum anseris* in **84f.**
—, *Drepanidotaenia przewalskii* in **206v.**
—, filixan **196b.**
—, helminths in **195b, 196e.**
Gordioidea, permeability of cuticle **79f.**
Gossypium hirsutum, Scutellonema clathricaudatum n.sp. on **43g.**
Germineae, see also Cereals, Grasses, Maize, Plants, Rice, Sugar-cane, generic names.
—, eelworms in **130a.**
Graphidium strigosum & myxomatosis in rabbit **42e.**
— — in rabbit, inhibition of development **42e.**
Grasses, see also Gramineae.
—, eelworms in **49g, 49h.**
—, *Meloidogyne* & root abnormalities in **49a.**
Grasshoppers, see also generic names.
—, *Physaloptera praeputialis* in **58a.**
—, *Turgida turgida* in **58a.**
Greece, *Strongyloides stercoralis* 82c.
Guatemala, see also Central America.
—, *Onchocerca volvulus* **222be.**
Guinea, see also Africa, West Africa.
—, Portuguese, onchocerciasis **88f.**
Guinea-pig, see also Animals laboratory, Rodents.
—, toxicity of *Parascaris* proteins to **206bl.**
Gulf of Panama, see also Caribbean, Central America.
—, Digenea **207a.**
Guschanskiana n.g. for *Accacladocoelium alveolatum* **203cj.**
Guschanskianinae n.subf. **203cj.**

Gymnothorax dovii, Sterrhurus tabogonus n.sp. in **207a.**
— *vicinus, Dollfustrema muraenae* n.sp. in **207a.**
Gynaecotyla adunca, oxygen uptake & nitrogen increase **36h.**
Gyrodactylus spp. on fresh-water fish in Czechoslovakia **29c.**
— spp., morphology **60d.**
— *callariatis* on *Gadus callarias* in Britain, first record **42c.**

Habronema & septicaemia in horse **72a.**
— *imbricata* in *Otus scops* in Russia, first record **130g.**
Haematology, see also Eosinophilia.
—, *Ancylostoma caninum* **35p.**
—, *Dictyocaulus* **206bm.**
—, fascioliasis **93c.**
Haemonchiasis in zebu, inheritance of resistance **72b.**
Haemonchus contortus, embryonation & development **47a.**
— — in sheep, antigenic stimulus of exsheathing fluid **42d.**
— —, technique for culturing *in vitro* **42b.**
— *placei* in cattle, phenothiazine **17a.**
Haemulon scudderi, Paracalceostoma calceostomoides n.g., n.sp. on **89b.**
Halycon chloris amoena, Microfilaria bruuni n.sp. in **217.**
Hamster, see also Animals laboratory, Rodents, generic names.
—, *Hymenolepis citelli* in **36e.**
—, — *diminuta* in **36e.**
Haplometra cylindracea, maturation & fertilization **174a.**
Hares, see also Rodents, generic names.
—, helminths in **203bi.**
Harposporium anguillulae in eelworms, technique for culturing & freeze-drying **42g.**
Helicotylenchus, morphology & synonymy **35a.**
— spp., hermaphroditism & spermatogenesis **43m.**
— n.spp. in *Poa pratensis* [nomina nuda] **35a.**
Heligmosomum petrovi n.sp. in *Clethrionomys* spp. in Russia **84a.**
Helisoma sp., intermediary for *Spirorchis elegans* **35m.**
— *trivolvis*, acrolein tested against **62a.**
Helminth antigens, chemistry **206j.**
— —, technique for preparing **101a.**
— cuticle, biochemistry **103b.**
— diseases, effect of irradiation 208b.
— immunity **203df.**
— ova in faeces, technique for concentrating 186f.
— — — —, — — detecting **30c.**
— — & larvae in faeces, effect of anthelmintics **206be.**
— —, technique for determining viability of **203e.**
— —, type of development **130y.**
— — on vegetables, control **122a.**
Helminthiasis, chemotherapy reviewed **13a.**
—, distribution **69d.**
—, pathological morphology 202a.
Helminthology reviewed **7j.**
— in Russia 203a, 203ci.
Helminths in *Alces alces*, ecology **203ce.**
— & animal husbandry **721.**
— in animals in Chad, survey **188b.**
— — —, dithiazanine **113b.**
— — —, effect on host metabolism **118a.**
— — — in Germany 29b.
— — — — — Russia **203cn.**
— — Anura in Russia, new records **219c.**
— — aquatic birds **196d.**
— — birds, adaptation **84b.**
— — — in Indonesia **37a.**
— — — — — Russia, new records **203cs, 219e.**
— — *Canis latrans* in U.S.A. **197a.**
— — *Capreolus capreolus* in Yugoslavia **70a.**
— — cat, anthelmintics tested **203cu.**
— — — & dog in Spain **59b.**
— — — in Japan **151b.**
— — cattle & sheep, control reviewed **189a.**
— — Charadriiformes in Far East **219b.**
— — — — — Russia **203bn.**
—, chromosome numbers **40a.**
—, classification **130bd.**
— in *Colymbus* spp. in Czechoslovakia **29f.**
— — *Cygnus bewickii* in Russia, new records **203cb.**
— — *Desmana moschata* **203be.**
—, distribution 203bk.
— in dog in Russia, survey **206m.**
— — domestic animals, control 203dg.
— — — — in Germany **18b.**
— — — — — — India, survey **149a.**
— — — — — — Israel **179a.**
— — — — — — Peru, Neguvon **210a.**
— — — — — — Sudan, general account **67a.**
— — — — — — West Africa, listed **188c.**
— — fowl, arecoline **203o.**
— — —, phenothiazine **203o.**
— — fresh-water fish in Czechoslovakia **214a.**
— — — — — — Poland **1a.**
— — — — — — Russia **206q.**
— — Galliformes in Russia **203bn.**
— — goose & duck in Russia **196e.**
— — — in Russia **195b.**
— — hares in Russia **203bi.**
— — insectivores in Czechoslovakia, new records & life-history **29j.**
—, intestinal, in man 131c.
— in jirds in Russia, new records **203k.**
— — *Lepus californicus* **25a.**
— — *Lyrurus tetrix* in Germany **18c.**
— — mammals in Indonesia **37a.**
— — — — — Russia **2061.**
— — man & animals, immunology **101a.**
— — —, dithiazanine **160c, 222ci.**
— — —, — iodide in mass treatment **94a.**
— — —, epidemiology 222co.
— — — in Formosa **7h.**
— — —, general account 160a.
— — — in Goa 222ch.
— — —, intraduodenal treatment **129a.**
— — — in Mozambique **222t.**
— — — — Poland **73c.**
— — —, research reviewed **222ce.**
— — — in Russia, epidemiology **203cy.**
— — —, treatment 115d, **153c.**
— — — in U.S.A. **6a.**
— — — — West Indies **222cq.**

Helminths in *Mogera robusta* in Russia **206u.**
— — *Panthera tigris* **149b.**
— — *Perdix perdix* in Poland, new records **1h.**
— — poultry, popular account **44b.**
— — — in Russia **206v.**
— — reptiles in Russia **203da.**
— — rodents in Spain, new records **187a.**
— — ruminants, ecology **29a.**
— — Russia, epidemiology & control 203de.
— — *Saiga tatarica* in Russia, new records **206p.**
— — sheep, ditrazine phosphate **153b.**
— — — & goat in Russia, new records **203c.**
— — — in Russia **29g.**
— — *Talpa europaea* in Poland **1i.**
— — — — — Russia **206u.**
— — — — —, new records **206t.**
— — *Tetrao urogallus* in Germany **18c.**
—, transmission by sewage 203m.
— transmitting bacteria & viruses **130bk.**
— & tropical eosinophilia in man **168a.**
— in turtles in U.S.A. **170a, 201a.**
Helobdella stagnalis, tetracotyle in **42f.**
Hemicycliophorinae n.subf. **1d, 203ch.**
Hemiurata, life-history **203ck.**
Hepaticola hepatica in rodents, life-history **203bv.**
— — — —, pathology **203bw.**
Hetaerina americana, *Neoprosthodendrium progeneticum* n.g., n.sp. [nomen nudum] in **35b.**
Heterakis gallinae in fowl, resistance **203db.**
— — larva, *Histomonas meleagridis* in **47i.**
Heterodera, general account **198f.**
— vulval cones, technique for preparing & mounting **198g.**
— spp. cysts, morphology **198g.**
— —, hatching responses **198n.**
— — in plants, general account 198 l.
— — — — in Latvia **203di.**
— *avenae*, see also *H. major*.
— — in cereals, general account **198k.**
— — — — in Russia **203bp.**
— —, meiosis **43a.**
— *cacti* in Russia, first record **203dd.**
— *fici* in *Ficus elastica* var. *decora* in Italy, first record **176a.**
— *glycines*, control **48a.**
— — larva, factors affecting emergence **48k, 48o.**
— — in soya bean, resistant variety **48m.**
— *major*, see also *H. avenae*.
— —, biotypes demonstrated **43c.**
— —, general account **213k.**
— — in Netherlands, control by crop rotation **68a.**
— *rostochiensis*, chromosome number **42a.**
— —, control **203cf.**
— —, — by chloropicrin 213f.
— —, — — methyl bromide **43s.**
— — cysts, effect of sulphur dioxide **43r.**
— — —, variability in egg content **43u.**
— —, hatching of "free" ova **12b.**
— — in potato, control **216a.**
— — — —, resistance **198t.**
— — — —, resistant varieties **216a.**
— — — —, reviewed **218.**
— — — — & tomato in Britain, distribution **198j.**
— — — soil, chloropicrin **203x.**
— —, technique for detecting in soil 213e.
— —, — — setting up hatching tests on **198o.**
Heterodera schachtii in beet, control 213b.
— — — *Beta patellaris*, resistance-breaking individuals **42k.**
— — cysts, factors affecting emergence **198p.**
— — —, stimulation of hatching **206bt.**
— —, general account 85a, 85b.
— —, historical account **43n.**
— —, penetration mechanism **43h.**
— — in sugar-beet, ecology **206bt.**
— — — —, effect of temperature & control 24a, **43w.**
— *scleranthii* n.sp. in *Scleranthus annuus* **203di.**
— *trifolii*, embryology & development **43y.**
— — in plants in Canada, susceptibility **43v.**
— (*Globodera*) n.subg. **1d.**
— (*Heterodera*) n.subg. **1d.**
Heteroderata n.subordo **203ch.**
Hexagenia limbata, 2nd intermediary for *Mosesia chordeilesia* **35b.**
Hexanchus griseus, *Phyllobothrium sinuosiceps* n.sp. in **47c.**
Hexatylus vigissi in potato, pathogenicity & transmission **206bs.**
Hibiscus esculentus, *Tylenchorhynchus acti* n.sp. on **43d.**
Hirudinea, see also generic & group names.
—, seasonal development of testes 79b.
Hirudo medicinalis, physiology **177a.**
Histology, ascarid cuticle **130bg.**
—, *Ascaris lumbricoides* var. *suum* **35r.**
—, cysticerciasis **130bj.**
Histomonas meleagridis in *Heterakis gallinae* larva **47i.**
Holland, see Netherlands.
Holocentrus ascensionis, *Lepidapedon truncatum* n.sp. in **207a.**
— —, *Stephanostomum pseudocarangis* n.sp. in **207a.**
Hookworm anaemia, see also Ancylostomiasis.
— — in man, effect on metabolism **108a.**
—, see also *Ancylostoma*, Creeping eruption.
— of dog, anaemia-producing factor **146b.**
— — —, survival in culture media **146a.**
Hookworms in man in Russia, control **203cx.**
Hoplodontophorus flagellum, redescribed & synonymy **190a.**
— *obtusa* synonym of *H. flagellum* **190a.**
Hoplolaimus angustalatus n.sp. on *Musa paradisiaca* var. *sapientum* in Tanganyika **43p.**
— *uniformis* & *Fusarium oxysporum* in pea, experimental **68d.**
Horse, see also Animals domestic, Equines.
—, ascarids & bacteria of **137a.**
—, ditrazine **206y.**
—, *Habronema* & septicaemia in **72a.**
—, iodine solution **203b.**
—, nematodes in **57a.**
—, *Parafilaria* in **206e.**
—, polymethylenepiperazine **8b.**
—, *Thelazia lacrymalis* in **203z.**
Howardula aoronymphium n.sp. in *Drosophila* spp. **47d.**
Hungary, *Ascaris* **153e.**
—, *Trichinella* not present in rodents & insectivores **29h.**
Hurleytrema trachinoti n.sp. in *Trachinotus goreensis* **40h.**

Hybridolepis n.g. for *Hymenolepis hughesi* **203cm.**
— *kwangensis* n.comb. for *Oligorchis kwangensis* **203cm.**
Hydatid, alveolar & *Echinococcus multilocularis*, discussed **222cl.**
—, —, in man **61a.**
—, in animals in Mexico **185b.**
— — — — U.S.A., diagnosis **35c.**
— — cattle 93a.
— — — & sheep, pathology 39b.
— cyst, permeability of wall **7c.**
— in domestic animals in Italy **211a.**
— — kidney of goat **72d.**
— — man **61a,** 119a, 152a.
— — — & animals, control 32a.
— — — — —, serological diagnosis **7e.**
— — —, immunological diagnosis **7i.**
— — —, serological diagnosis **7f.**
— — — & sheep in New Zealand, control **44a.**
— — — in U.S.A. 99a.
— — mouse, development of resistance **7d.**
— — ruminants in West Pakistan **28c.**
— — *Sus scrofa* in Czechoslovakia, first record **128c.**
Hydatidosis in Americas, reviewed **222cg.**
—, control 44c.
— in Turkey 208a.
Hydatigera taeniaeformis in rat, resistance **35o.**
Hymenolepididae, types of arrangement of genitalia **79a.**
Hymenolepis arctica to *Wardium arctica* n.comb. **79a.**
— *citelli* in hamster, effect of host diet on size **36e.**
— — & *H. diminuta* in hamster, effect of mixed infection & host diet on size **36e.**
— *diminuta* in hamster, effect of host diet on size **36e.**
— *hughesi* to *Hybridolepis* n.g. **203cm.**
— *lineola* to *Lineolepis lineola* n.comb. **79a.**
— *longicirrosa* scolex, morphology **195b.**
— *nana*, effect of antiserum on ova, cysticercoids & adult **36k.**
— —, life-history & development in intermediaries **36j.**
— — in man, treatment 186g.
— — ova, development in culture **156a.**
— *nonarmatus* for *Oligorchis nonarmatus* **203cm.**
— *parva* to *Lineolepis* n.g. **79a.**
Hyostrongylus rubidus in pig, treatment **72f.**
Hystrichis tricolor in duck, life-history **203bd.**

Immunity, *Aphelenchoides besseyi* **48f.**
—, *Ascaridia galli* **96b.**
—, *Aspiculuris tetraptera* **36c, 36d.**
—, *Dictyocaulus filaria* **203j.**
—, — *viviparus* **19b, 72g.**
—, haemonchiasis **72b.**
—, helminths **203df.**
—, *Heterakis gallinae* **203db.**
—, *Heterodera glycines* **48m.**
—, — *rostochiensis* **198t.**
—, hydatid **7d.**
—, *Hydatigera taeniaeformis* **35o.**
—, *Litomosoides carinii* **222bq.**
Immunity, *Meloidogyne* spp. **35k, 48l, 49u.**
—, — *incognita* **49q.**
—, — — & black shank **35j.**
—, — — var. *acrita* **35d, 49q.**
—, — — — — & black shank **35j.**
—, *Nematodirus* spp. **72k, 72m.**
—, *Schistosoma mansoni* **35g.**
—, *Schistosomatium douthitti* **35g.**
Immunology, see also Serology.
—, *Ancylostoma caninum* **35p.**
—, *Ascaris* **55a.**
—, *Fasciola hepatica* **88a.**
—, *Haemonchus contortus* **42d.**
—, helminths in man & animals **101a.**
—, hydatid **7i.**
—, *Hymenolepis nana* **36k.**
—, *Schistosoma* **88a.**
—, — *mansoni* **58d.**
—, *Trichinella* **59a.**
—, — *spiralis* 206k.
India, see also Goa.
—, ancylostomiasis 140b.
—, *Clinostomum* metacercariae **33a.**
—, dracontiasis 134a.
—, eelworms & decline in *Citrus* **33b.**
—, filariasis **133e.**
—, helminths in domestic animals **149a.**
—, *Meloidogyne javanica* **33c.**
—, *Parafilaria* sp. **33d.**
—, *Wuchereria bancrofti* 115b, **222bx.**
—, — *malayi* **133b.**
Indonesia, see also specific territories.
—, filariasis **222bm.**
—, helminths in birds **37a.**
—, — — mammals **37a.**
Insectivores, see also Animals, Mammals, generic & group names.
—, helminths in **29j.**
Insects, see generic & group names.
Invertebrates, see Animals, generic & group names.
Iotonchidae n.fam. **1d, 203ch.**
Iraq, schistosomiasis **222w.**
Israel, helminths in domestic animals **179a.**
Italy, eelworms in fruit trees **136a.**
—, — — vine **136a.**
—, *Fasciola hepatica* **215b.**
—, *Heterodera fici* **176a.**
—, hydatid **211a.**
—, lungworms **215c.**
—, *Neostrongylus linearis* **215c.**
Itvogonimus lorum in *Talpa europaea* in Britain, biology & distribution **47g.**
— *ocreatus* in *Talpa europaea* in Britain, biology & distribution **47g.**
Ivory Coast, see also Africa, French West Africa, West Africa.
— —, eelworms **43c.**

Japan, see also Far East.
—, gnathostomiasis **222cr.**
—, helminths in cat **151b.**
Jirds, see also Rodents.
—, helminths in **203k.**

Köllikeria filicollis in *Brama raii*, redescription & systematic position **47b.**
Korea, see also Far East.
—, clonorchiasis **117a.**
—, paragonimiasis **117a.**
Kyphosus analogus, *Megasolena kyphosi* n.sp. in **207a.**
— *elegans*, *Myodera magna* n.sp. in **207a.**

Labronema mauritiense n.sp. **46a.**
— *parvum* n.sp. **46a.**
Lactophrys trigonus, *Apocreadium angustum* n.sp. in **207a.**
— —, *Cableia trigoni* n.g., n.sp. in **207a.**
Larva migrans, see also Creeping eruption.
— —, visceral, in man in Britain **15a.**
— —, —, — —, serological diagnosis **222ck.**
— —, —, — —, serology **144a.**
— —, —, — rodents **203r.**
Lasiotocus chaetodipteri n.sp. in *Chaetodipterus lippei* **40h.**
— *cynoglossi magniovatus* n.sp., n.subsp. in *Cynoglossus goreensis* **40h.**
— — *major* n.sp., n.subsp. in *Cynoglossus goreensis* **40h.**
Lateriporus karajasicus to *Dendrouterina karajasicus* n.comb. **130n.**
Latvia, see also Russia.
—, *Heterodera* spp. **203di.**
—, *Meloidogyne* **203di.**
Lecithodendrium hovorkai n.sp. in bats in Czechoslovakia **130d.**
— (*Lecithodendrium*) *hovorkai* n.sp. in bats in Czechoslovakia **130d.**
Lepidapedon parepinepheli n.sp. in *Epinephelus tigris* **207a.**
— *truncatum* n.sp. in *Holocentrus ascensionis* **207a.**
Lepomis spp., *Pisciamphistoma reynoldsi* n.sp. in **148a.**
Leptodactylus typhonius, *Schrankiana formosula* n.sp. in **104a.**
Lepus californicus, helminths in **25a.**
— *timidus*, *Plagiorchis vespertilionis* in **203bi.**
Leuciscus idus, *Diplozoon megan* on **79d.**
Liberia, see also Africa, West Africa.
—, onchocerciasis **222bf.**
Libya, see also Africa.
—, cysticerciasis 215d.
Life-history, see also Development, Embryology.
—, *Amidostomum anseris* **196e.**
—, *Apatemon gracilis pellucidus* **200a.**
—, *Ascaridia galli* **96b.**
—, *Astiotrema trituri* **21a.**
—, cestodes in fowl **96a.**
—, *Cosmocercoides dukae* **173a.**
—, *Dicrocoelium dendriticum* **69b.**
—, *Dictyocaulus* spp. **103a.**
—, *Diphyllobothrium latum* **130z.**
—, *Drepanidotaenia przewalskii* **196e.**
—, *Echinoparyphium spiniferum* **76d.**
—, *Filicollis anatis* **206b.**
—, gnathostomiasis **222cr.**
Life-history, *Gongylonema problematicum* **203bc.**
—, helminths in insectivores **29j.**
—, Hemiurata **203ck.**
—, *Hepaticola hepatica* **203bv.**
—, *Hymenolepis nana* **36j.**
—, *Hystrichis tricolor* **203bd.**
—, *Mesostephanus kentuckiensis* **35e.**
—, *Metastrongylus* spp. **128b,** 130bp.
—, — *elongatus* **103a.**
—, *Mosesia chordeilesia* **35b.**
—, *Parabronema skrjabini* **203ba.**
—, *Plagiorchis arcuatus* **206d.**
—, *Porrocaecum ensicaudatum* **84g.**
—, — *heteroura* **130x.**
—, *Prosthogonimus pellucidus* **130m.**
—, *Rictularia coloradensis* **35n.**
—, *Spirorchis elegans* **35m.**
—, *Staphylocystis furcata* **1e.**
—, *Strongyloides fülleborni* **28b.**
Ligula pavlovskii n.sp. in *Benthophilus stellatus* **79e.**
Limnodromus griseus scolopaceus, *Shipleya dioica* n.sp. in **84h.**
Limnomermis for *Paramermis fluviatilis* **79g.**
Lineolepis n.g. for *Hymenolepis parva* **79a.**
— *lineola* n.comb. for *Hymenolepis lineola* **79a.**
Litomosa vite to *Paracanthocheilonema vite* n.g., n.comb. **203k.**
Litomosoides carinii in rat, experimental **77b.**
— — — *Sigmodon hispidus*, experimental **222bu.**
— — — — — —, immunity **222bq.**
— — — — — —, symmetrical bis-isoquinolinium compounds **222bp.**
Liver-fluke, see also *Dicrocoelium*, *Fasciola*.
— in sheep, treatment **30d.**
Loa loa in man, serology **222br.**
— — (monkey strain) antigens **222br.**
Loaiasis in man 82b.
Longidorus laevicapitatus n.sp. **46a.**
Longistriata vigisi n.sp. in *Talpa europaea* in Russia **206t.**
Lucioperca lucioperca, *Bucephalus markewitschi* in **206q.**
Lumbricus terrestris, intermediary for *Porrocaecum ensicaudatum* **84g.**
Lungworms, see also generic names.
— in *Capra ibex*, pathology **123b.**
— — cattle, cyanacethydrazide **72j.**
— — —, — & phenothiazine **199b.**
— — — in Northern Ireland, experimental **20a.**
— — domestic animals, cyanacethydrazide **199a.**
— — *Rupicapra rupicapra*, pathology **123b.**
— — sheep in Czechoslovakia **60c.**
— — —, ditrazine salts **203bu.**
— — — in Italy **215c.**
—, technique for assessing efficacy of treatment of sheep for **130bo.**
Lutjanus jordani (?), *Gonacanthella lutjani* n.g., n.sp. in **207a.**
Lycopersicon sp., *Meloidogyne* spp. in **35k.**
Lymnaea, see also *Galba*.
— spp. in Egypt, morphology **142a.**
— *caillaudi*, *Fasciola* sp. in **142a.**
— *stagnalis*, *Cercaria natrouni* n.sp. in **142a.**
— —, — *spinulosa* n.sp. in **219d.**
— —, *Xiphidiocercaria I* to *VI* n.spp. in **219d.**
— *truncatula*, *Fasciola hepatica* in **130t.**

Lyperosia titillans, intermediary for *Parabronema skrjabini* **203ba.**
Lyrurus tetrix, *Capillaria alpina* n.sp. in **18c.**
— —, helminths in **18c.**

Macracis synonym of *Ozolaimus* **89d.**
— *monhystera* to *Ozolaimus monhystera* n.comb. **89d.**
Macroposthoniidae n.fam. **1d, 203ch.**
Macroposthoniinae n.subf. **1d, 203ch.**
Madagascar, filariids in birds **10d.**
—, *Wuchereria bancrofti* 154c.
Maize, see also Cereals, Gramineae.
—, *Aphelenchus avenae* controlling *Pythium arrhenomenes* on **49r.**
—, *Meloidogyne* spp. in **48b.**
Malaya, see also Far East.
—, filariasis **222bl.**
Mammals, see also Animals, generic & group names.
—, helminths in **37a, 206 l.**
—, nematode larvae in **122b.**
—, *Trichinella spiralis* in **40f.**
Man, 6171 RP **154b.**
—, *Acanthocheilonema perstans* in **88i, 160b.**
—, Alcopar **88b,** 115c.
—, alveolar hydatid in **61a.**
—, ancylostomiasis in 140b, 186a.
—, ascariasis in 39a, **80a,** 110d.
—, — & amoebiasis in 222cp.
—, *Ascaris* & intestinal obstruction in 132a.
—, *Carica papaya* seed **38a.**
—, cercarial dermatitis in **130bc.**
—, cerebral cysticerciasis in 110f.
—, — paragonimiasis in 100a.
—, Cestodin **125a.**
—, clonorchiasis in **117a.**
—, *Clonorchis sinensis* in **5a, 166b.**
—, creeping eruption in **14a.**
—, cysticerciasis in 50a, **52a, 166c.**
—, — of central nervous system in **203n.**
—, *Dicrocoelium dendriticum* in 145a.
—, diethylcarbamazine **133d.**
—, *Diphyllobothrium* in **91a,** 186h.
—, — anaemia in **92a.**
—, — *latum* & vitamin B_{12} deficiency in **222cf.**
—, dithiazanine **19a, 87a, 88c, 110b, 160c, 222ci.**
—, — iodide **94a,** 186c.
—, dracontiasis in 134a.
—, elephantiasis in **11a.**
—, enterobiasis in 183a.
—, *Fasciola hepatica* in **19c, 88a.**
—, fascioliasis in **19d.**
—, filariasis in 116a, **133e, 143a, 222o, 222bj, 222bl, 222bm, 222bw.**
—, — & chyluria in 54a.
—, — bancrofti in **222bn.**
—, filarioids & purpura in **222bt.**
—, glucosamine **95a, 141a.**
—, gnathostomiasis in **222cr.**
—, helminths in **6a, 7h, 73c, 101a,** 115d, **129a, 153c,** 160a, **203cy, 222t, 222ce,** 222ch, 222co, **222cq.**
—, — & tropical eosinophilia in **168a.**
—, hookworm anaemia in **108a.**
—, hookworms in **203cx.**
Man, hydatid in **7e, 7f, 7i,** 32a, **44a, 61a,** 99a, 119a, 152a.
—, *Hymenolepis nana* in 186g.
—, intestinal helminths in 131c.
—, *Loa loa* in **222br.**
—, loaiasis in 82b.
—, M & B 2948A **141e.**
—, nematodes in **110a,** 186e.
—, — & diarrhoea in 186b, 186d.
—, ocular onchocerciasis in 222bc.
—, *Onchocerca volvulus* in **222be.**
—, onchocerciasis in **13b, 13e,** 83a, **88f, 117b, 121a, 160b, 222bf.**
—, paragonomiasis in 75a, **117a, 222cm.**
—, *Paragonimus westermani* in **5a.**
—, piperazine citrate **38a,** 131e.
—, potassium antimony dimercaptosuccinate **222k.**
—, *Schistosoma* in **88a.**
—, — *haematobium* in 82a, **88h, 154a, 222n.**
—, — *mansoni* in **36a, 110c,** 139a, 161a, **222j, 222m.**
—, schistosome dermatitis in **222bb.**
—, schistosomiasis in **88d, 88g, 141b,** 222a, 222 l, 222r, **222w, 222ba.**
—, — of cervix in 116b.
—, — — vulva in 116c.
—, — haematobia in **41a.**
—, sodium antimony gluconate **222k.**
—, — pyrocatechol antimony disulphonate **222k.**
—, stibophen **141f.**
—, *Strongyloides stercoralis* in 82c.
—, strongyloidiasis in 131a, 147a.
—, TWSb **121b, 222u, 222bh.**
—, *Taenia saginata* in **29i.**
—, tetrachlorethylene **185a.**
—, — & piperazine **185c.**
—, toxicity of nitrated aluminium naphtholate to **141c.**
—, *Trichinella spiralis* in **1g.**
—, trichinelliasis in **56a,** 166a, **173b.**
—, tropical eosinophilia in **7k,** 140a.
—, visceral larva migrans in **15a, 144a, 222ck.**
—, vitamin E **222cs.**
—, *Wuchereria bancrofti* in **13d,** 115b, **222bx, 222ca, 222cc, 222cd.**
—, — — microfilaria in eye of 154c.
—, — — races in **222bk.**
—, — *malayi* in **133b, 222by.**
Mansonia annulifera, ecology **133a.**
— *uniformis*, ecology **133a.**
Margeana Cort, 1919 re-established **9a.**
— n.comb. for *Glypthelmins* spp. **9a.**
Marisa cornuarietis controlling *Australorbis glabratus* **7g.**
Marshallagia marshalli, variations in dorsal ray **203d.**
— *petrovi* n.sp. in sheep in Russia **203f.**
Mastophorus petrowi n.sp. in *Sciurus vulgaris* in Russia **206 l.**
Mauritania, see also Africa, West Africa.
—, schistosomiasis 222r.
Mauritius, eelworms in sugar-cane **46a.**
Mazocraeoides olentangiensis n.sp. on *Dorosoma cepedianum* 35h.
Megalodiscus temperatus in *Rana pipiens* in Costa Rica, first record **182a.**
Megalops atlanticus, *Bivesicula tarponis* n.sp. in **40i.**

Megasolena kyphosi n.sp. in *Kyphosus analogus* **207a.**
Megeurystomina combesi n.g., n.sp. **102a.**
Meloidogininae n.subf. **203ch.**
Meloidogyne controlled by fungi **203cp.**
— in cotton, Nemagon (liquid & granular) **49k.**
— — plants in Latvia, host list **203di.**
— — — — Russia **203y.**
— reviewed **198e.**
— & root abnormalities in grasses **49a.**
— in soil, treatment 213 l.
— — sugar-cane in South Africa, popular account **64a.**
— — tomato, effect of trace elements **213a.**
— — —, ethylene dibromide **49n.**
— — —, Vapam **213m.**
— sp. in cotton, dibromochloropropane **49j.**
— spp. in cowpea, resistant lines **48 l.**
— — — Cucurbitaceae, susceptibility tested **49u.**
— — — *Lycopersicon* sp., resistance **35k.**
— — — maize, *Avena* sp. & soya bean, host-parasite relationship **48b.**
— — — plants in Nyasaland, host list **43t.**
— — — — — Rhodesia, host list **43t.**
— — — tomato, experimental **150a.**
— — — vine, hot-water treatment **49p.**
— *arenaria* in *Ficus elastica* var. *decora* **176a.**
— — *thamesii* in *Saintpaulia ionantha* **191a.**
— *hapla* in strawberry, control **178a.**
— — — tomato, development **43e.**
— *incognita* & bacterial wilt in bean **49b.**
— — — black shank in tobacco, resistant varieties **35j.**
— — host-parasite relationship, technique for studying **43f.**
— — in potato, D-D **48n.**
— — — red & white clover, resistance **49q.**
— — var. *acrita* & black shank in tobacco, resistant varieties **35j.**
— — — — in soya bean, resistance **35d.**
— — — — — red & white clover, resistance **49q.**
— — — — — sweet-potato, control by nematicides **48d.**
— *javanica* in *Colocasia antiquorum* in India **33c.**
— — — tomato, development **43e.**
Meloidogyninae n.subf. **1d.**
Menetus dilatatus, intermediary for *Spirorchis elegans* **35m.**
Mermithidae, taxonomy & key to genera **79g.**
Mesomermis sphaerocephala to *Amphidomermis* **79g.**
Mesostephanus kentuckiensis, life-history **35e.**
— — metacercariae in fresh-water fish, host list **35e.**
Metadilepidinae n.subf. **130r.**
Metagonimus yokogawai metacercaria in fish in Czechoslovakia **130k.**
Metastrongyles in pig, lymphatic formations **93e.**
Metastrongylus & infectious encephalomyelitis in pig **194b.**
— in pig, ditrazine **206x.**
— spp. in pig in Czechoslovakia, life-history **128b,** 130bp.
— *elongatus* ova & larvae, biochemistry & development **103a.**
— — in pig, pathology, experimental **72i.**
Mexicana bychowskyi n.g., n.sp. on Sciaenidae in Mexico **89b.**
Mexico, see also North America.
—, hydatid **185b.**
—, *Mexicana bychowskyi* n.g., n.sp. **89b.**
—, microfilariae in birds **40d.**
—, *Paracalceostoma calceostomoides* n.g., n.sp. **89b.**
Microfilaria bruuni n.sp. in *Halcyon chloris amoena* in British Solomon Islands **217.**
Microfilariae, see also generic names of adults.
— in birds in Mexico **40d.**
— of birds, morphology **222bs.**
—, periodicity discussed **222bp.**
Microtetrameres sp. in *Athene noctua*, first record **130g.**
Microtus arvalis, *Thominx sadovskajae* n.sp. in **203br.**
Mogera robusta, helminths in **206u.**
Molluscicides, see also Control.
—, acrolein **62a.**
—, Bayer 73 **222v.**
—, chlorinated phenols **153a.**
—, copper compounds **222y.**
—, sodium pentachlorophenate **117c.**
Molluscs, see also generic & group names.
—, fresh-water, cercariae in **219d.**
Mongolia, see also China, Far East, Russia.
—, *Thelazia lacrymalis* **203z.**
Moniezia in sheep, copper compounds **130be.**
— spp., new intermediaries **206c.**
— — in sheep, epidemiology **206g.**
— — — —, lead arsenate **97a.**
— — — —, seasonal & age variation **206f.**
— *expansa* in *Saiga tatarica* **79i.**
Monieziasis in sheep, nervous symptoms **206bj.**
Moniliformis dubius, aerobic metabolism **36m.**
— *moniliformis* larva in *Scarabaeus sacer*, first record **203bs.**
Monkey, see also Mammals, generic & group names.
—, miracil-D **222x.**
Monogenea, see also Trematodes.
— on marine fish in U.S.A., new records **171b.**
Morphology, Acanthocephala **84d.**
—, *Anguina* **198c.**
—, *Anomotaenia globula* ova **84i.**
—, *Aporcelaimus* **46a.**
—, *Arostellina reticulata* **203co.**
—, *Bidentostomum ivaschkini* **203cw.**
—, *Cylicodontophorus mongolica* **203cw.**
—, *Cymatocarpus undulatus* **89a.**
—, *Dactylogyrus* spp. **60d.**
—, — *hemiamphibothrium* **29d.**
—, *Dendritobilharzia pulverulenta* **130o.**
—, Digenea **89c.**
—, *Diplotriaena nagpurensis* **175a.**
—, *Dirofilaria striata* **111a.**
—, *Ditylenchus* **198c.**
—, *Dorylaimus* **46a.**
—, *Euclinostomum heterostomum* ova & miracidia **23a.**
—, *Fasciola* spp. **114a.**
—, *Ferrissia tenuis* **222c.**
—, *Gastrotaenia cygni* **206n.**
—, *Gyrodactylus* spp. **60d.**
—, *Helicotylenchus* **35a.**
—, *Heterodera* spp. cysts **198g.**
—, *Hoplodontophorus flagellum* **190a.**

Morphology, *Hymenolepididae* **79a.**
—, *Hymenolepis longicirrosa* **195b.**
—, *Köllikeria filicollis* **47b.**
—, *Lymnaea* spp. **142a.**
—, marine eelworms **102a.**
—, *Marshallagia marshalli* **203d.**
—, microfilariae of birds **222bs.**
—, *Onchocerca* spp. larva **206a.**
—, *Oschmarinolepis microcephala* **130n.**
—, *Parafilaria multipapillosa* larva **206a.**
—, *Parafimbriaria websteri* **130n.**
—, *Paraphelenchus* **43z.**
—, *Paricterotaenia parvirostris* **130j.**
—, *Pfenderius heterocaeca* **135a.**
—, — *papillatus* **135a.**
—, *Prosthogonimus pellucidus* **130m.**
—, *Pseudaproctella nuda* **10b.**
—, *Pseudodiscus collinsi* **172a.**
—, — *hawkesii* **135a.**
—, *Schrankiana larvata* **104a.**
—, — *schranki* **104a.**
—, *Scutellonema boocki* **180b.**
—, *Setaria equina* larva **206a.**
—, *Splendidofilaria gretillati* microfilaria **10e.**
—, *Strongyloides fülleborni* **28b.**
—, *Trichobilharzia* spp. **190b.**
—, *Tridentoinfundibulum gobi* **203cw.**
—, *Turgida turgida* larvae **58b.**
Mosesia chordeilesia, life-history **35b.**
Mouse, see also Rodents, generic names.
—, *Ascaris tarbagan* in **203bq.**
—, *Aspiculuris tetraptera* in **36c, 36d.**
—, effect of immunization with human erythrocytes on action of *Ascaris* extract **55a.**
—, *Gongylonema problematicum* in **203bc.**
—, hydatid in **7d.**
—, *Muspicea borreli* in **98a.**
—, piperazine citrate **40b.**
—, *Plagiorchis cirratus cirratus* in **76b.**
—, *Schistosoma mansoni* in **7b, 222i.**
—, — — & oesophageal varices in 222o.
Mozambique, see also Africa, East Africa.
—, helminths in man **222t.**
—, *Schistosoma haematobium* **222n.**
—, schistosome intermediaries **88e.**
—, schistosomiasis **88d.**
Musa paradisiaca var. *sapientum*, *Hoplolaimus angustalatus* n.sp. on **43p.**
Muspicea borreli in mouse in Algeria **98a.**
Mycteroperca falcata, *Podocotyle mycteropercae* n.sp. in **207a.**
Myodera magna n.sp. in *Kyphosus elegans* **207a.**
Myxolepis n.g. for *Dicranotaenia collaris* **79a.**

Nagmia floridensis to *Petalodistomum floridensis* n.comb. **89c.**
Neascus cuticola in fresh-water fish in Russia **79c.**
Nemachilus barbatus toni, *Crepidostomum nemachilus* n.sp. in **84a.**
Nematicides (plant eelworm), see also Control, Treatment.
— — —, butyl chlorides **203bf.**
— — —, chloropicrin **203x, 203cf,** 213f.
— — —, D-D **48d, 48n, 65a, 212a.**
— — —, — increasing southern blight on tomatoes **49t.**
Nematicides (plant eelworm), dibromochloropropane **48j, 49j.**
— — —, ethyl ether of dimethyldithiocarbamic acid **203cf.**
— — —, ethylene dibromide **48d, 49i, 49n.**
— — —, general account **198r.**
— — —, methyl bromide **43s, 48e.**
— — —, Nemagon **48h, 49k.**
— — —, parathion **203u.**
— — —, rhodanine compounds **48e.**
— — —, sulphur dioxide **43r.**
— — —, Vapam **213m.**
Nematode larvae, failure in inhibit bacterial growth in culture **113c.**
— — in mammals in Czechoslovakia **122b.**
— —, technique for estimating in suspension **53a.**
Nematodes, free-living, fresh-water, marine & plant-parasitic, see Eelworms.
— in animals, chenopodium oil 206bf.
— — birds in Russia **219a.**
— — cattle, effect on blood & liver copper **16a.**
— — — & sheep, control **63a.**
— — — — — —, Ruelene 126a.
— & diarrhoea in man, treatment 186b, 186d.
— in dog, Neguvon **211c.**
— — fowl, hygromycin **105a.**
— — horse, polymethylenepiperazine **8b.**
— — —, popular account **57a.**
— — man, Alcopar **88b.**
— — —, dithiazanine **88c.**
— — —, — iodide 186c.
— — —, piperazine citrate 131e.
— — — in Puerto Rico **110a.**
— — —, tetrachlorethylene & piperazine **185c.**
— — —, treatment 186e.
— — pig, hygromycin B 66a, **71b.**
— — —, piperazine **51a.**
— — plants, general account **198b.**
— — poultry in Russia, new records **196a.**
— — sheep & goat, Dipterex **30e.**
— — —, phenothiazine, effect of particle size **8d.**
— — turkeys in Czechoslovakia, new records **130b.**
— — *Varanus* spp. in Borneo **28a.**
Nematodirus spp. larvae, survival on pasture **72k, 72m.**
— — in sheep, control **3a.**
— — — — —, resistance **72k, 72m.**
— *filicollis* in sheep, bephenium embonate **72h.**
Nematology in Britain, historical account **198a.**
Nematoparataenia skrjabini n.sp. in *Cygnus olor* in Russia **206n.**
Nematoparataeniinae n.subf. **206n.**
Nematoxynema synonym of *Spironoura* **76e.**
Nematoxys piscicola to *Spironoura piscicola* n.comb. **76e.**
Nemonchidae n.fam. **1d, 203ch.**
Nemonchinae n.subf. **1d, 203ch.**
Neoangularia synonym of *Neolagia* **130j.**
Neoascaris in cattle, piperazine adipate **123c.**
— *vitulorum* in goat, experimental **124a.**
Neodiplostomum (*Fibricola*) for *Fibricola* **47e.**
— *intermedium* n.sp. in *Rattus assimilis* **47e.**
Neolagia for *Anomotaenia depressa* **130j.**
—, synonymy **130j.**
Neoprosthodendrium progeneticum n.g., n.sp. [nomen nudum] in *Hetaerina americana* **35b.**

Neostrongylus linearis in sheep in Italy, first record **215c.**
Netherlands, *Ditylenchus destructor* **68b.**
—, eelworms in plants **68c.**
—, *Heterodera major* **68a.**
Nettapus auritus, *Trichobilharzia duboisi* n.sp. in **190b.**
Neurofilaria Whitlock, 1952 to Metastrongylidae **10c.**
— *cornellensis* Whitlock, 1952 to *Elaphostrongylus* **31a.**
New Guinea, see also Pacific Islands.
— —, *Wuchereria bancrofti* intermediaries **222bz.**
— Zealand, *Coenurus* **44a, 45a.**
— —, hydatid **44a.**
Nigeria, see also Africa, Cameroons, West Africa.
—, onchocerciasis **13b.**
—, *Simulium* spp. **117b.**
Nomenclature, *Australorbis* **42j.**
—, *Biomphalaria* **42j.**
—, *Schistosoma mansoni* intermediaries **42j.**
—, *Tropicorbis* **42j.**
North America, see also Americas, Canada, Mexico, U.S.A.
— —, *Apatemon gracilis pellucidus* **200a.**
— —, schistosome dermatitis **222bb.**
— —, *Simulium* spp. **117b.**
Northern Ireland, see also Britain.
— —, lungworms **20a.**
Nothanguina n.g. for *Anguina cecidoplastes* **43j.**
Notocotylus attenuatus in *Radix auricularia*, first record **196e.**
Notopentorchis iduncula n.comb. for *Paruterina iduncula* **130j.**
— *vesiculigera* n.comb. for *Paruterina vesiculigera* **130j.**
Numenius arcuatus, *Anomotaenia nymphaea* f. *megacantha* n.forma in **84c.**
Nyasaland, see also Africa.
—, *Meloidogyne* spp. **43t.**

Odontophora villoti n.sp. **102a.**
— *wieseri* n.sp. **102a.**
Oligorchis discussed **203cm.**
— spp. to *Paradilepis* **203cm.**
— *cyanocittii* to *Passerilepis cyanocittii* n.comb. **203cm.**
— *kwangensis* to *Hybridolepis kwangensis* n.comb. **203cm.**
— *nonarmatus* to *Hymenolepis nonarmatus* **203cm.**
Omphalometra flexuosa in *Talpa europaea* in Britain, biology & distribution **47g.**
— — — — — — Germany **76b.**
Onchium parocellatum n.sp. **102a.**
Onchocerca spp. larva, morphology **206a.**
— — & periodic ophthalmia in equines **130bi.**
— *volvulus* in man in Guatemala **222be.**
— — — —, TWSb **222bh.**
Onchocerciasis in Central America, discussed **222bd.**
— — equines in China, first record **30b.**
— — man 83a.
— — — in Africa, general account **121a.**
— — — — Cameroons **160b.**
— — —, control **117b.**
— — — in Liberia **222bf.**
Onchocerciasis in man in Nigeria, survey **13b.**
— — — — Portuguese Guinea **88f.**
— — — — Sudan, control **13e.**
—, ocular, in man 222bc.
Onchocercidae nom.nov. for Dipetalonematidae **10c.**
Oncomelania, sex not affecting sex of *Schistosoma japonicum* cercariae **77a.**
— spp., hybridization **71.**
— *nosophora*, chemistry of shell **7a.**
Onion, *Ditylenchus dipsaci* in **35f, 206bv.**
—, eelworms in **203cq.**
Opisthodiscus diplodiscoides nigrivasis to *O. nigrivasis* **76c.**
— *nigrivasis* for *O. diplodiscoides nigrivasis* **76c.**
Opisthorchis in cat & dog in Russia **195c.**
— *felineus* in *Bithynia leachi*, development **130v.**
Oribatid mites, ecology **206g.**
— —, intermediary for *Moniezia* spp. **206c.**
Ornithofilaria inornata Anderson, 1956 to *Pseudaproctella inornata* n.comb. **10b.**
— *skrjabini* n.comb. for *Cardiofilaria skrjabini* Petrov & Chertkova, 1947 **10b.**
Ornithofilariinae n.subf. **10c.**
Oschmarinolepis microcephala in *Ciconia ciconia*, morphology **130n.**
Ostertagia spp., technique for culturing *in vitro* **42b.**
— *ostertagi* in sheep, development **130s.**
Oswaldonema rysavyi n.sp. in *Rattus rattus alexandrinus* **29e.**
Otus scops, *Habronima imbricata* in **130g.**
Ozolaimus, synonymy **89d.**
— *cirratus* in *Ctenosaura similis similis*, first record **89d.**
— *monhystera* n.comb. for *Macracis monhystera* **89d.**

Pachycreadium lerneri n.sp. in *Gerres cinereus* **207a.**
Pacific, Digenea **89c.**
— Islands, see also specific territories.
— —, *Wuchereria bancrofti* **222bk.**
Pallasea quadrispinosa, *Pseudoechinorhynchus clavula* larva in **219f.**
Panax ginseng, *Aphelenchoides panaxi* n.sp. in **206bu.**
— —, — *parietinus* in **206bu.**
Panthera tigris, helminths in **149b.**
Parabronema skrjabini in ruminants, life-history **203ba.**
Paracalceostoma calceostomoides n.g., n.sp. on *Haemulon scudderi* in Mexico **89b.**
Paracanthocheilonema n.g. for *Litomosa vite* **203k.**
Paradilepis for *Oligorchis* spp. **203cm.**
— revised **130p.**
Parafilaria in horse in Russia **206e.**
— sp. in buffalo in India **33d.**
— *multipapillosa* larva, morphology **206a.**
Parafimbriaria websteri in *Colymbus caspicus caspicus*, morphology **130n.**
Paragonimiasis, cerebral, in man 75a, 100a.
— in man in Korea **117a.**
— — —, serological diagnosis **222cm.**
Paragonimus metacercaria, excystation **165a.**
— *westermani* in man, diagnosis by intradermal tests **5a.**

Paralepoderma brumpti in *Rana temporaria* in Russia, first record **203bj.**
— *progeneticum* in *Planorbis planorbis* in Russia, first record **203bj.**
Paramermis spp. to *Gastromermis* **79g.**
— *fluviatilis* to *Limnomermis* **79g.**
Paramicipsella suppressed **10b.**
Paramphistomiasis in cattle, pathogenicity **130bh.**
Paraphelenchus, excretory system & hemizonid **43z.**
Parascaris body fluid, *p*H **206bk.**
— proteins, toxicity to guinea-pig **206bl.**
— *equorum* ova killed by *o*-cresol **18d.**
Parasitology, bibliography 221.
Parasitylenchus, revision **47d.**
— *diplogenus* n.sp. in *Drosophila* spp. **47d.**
Paraspina argentinensis n.comb. for *Proneochasmus argentinensis* **207a.**
Parastrongyloides skrjabini n.sp. in *Talpa europaea* in Russia **206t.**
Paratractis n.g. for *Ascaris hystrix* Diesing, 1851 **40c.**
Paratylenchus amblycephalus n.sp. in apple **43b.**
Pareurystomina armorica n.sp. **102a.**
Paricterotaenia parvirostris, morphology **130j.**
Paruterina iduncula to *Notopentorchis iduncula* n.comb. **130j.**
— *rectangula* n.comb. for *Biuterina rectangula* **203ct.**
— *vesiculigera* to *Notopentorchis vesiculigera* n.comb. **130j.**
Paruterinidae discussed **130r.**
Passeriformes, see also Birds, generic & group names.
—, dilepidids in **130j.**
Passerilepis cyanocittii n.comb. for *Oligorchis cyanocittii* **203cm.**
Pathogenicity, *Dictyocaulus filaria* **206bn.**
—, helminths in animals **118a.**
—, *Hexatylus vigissi* **206bs.**
—, hookworm anaemia **108a.**
—, paramphistomiasis **130bh.**
—, *Pratylenchus penetrans* & *Tylenchorhynchus martini* **48p.**
—, *Trichuris trichiura* **215a.**
Pathology, *Dictyocaulus filaria* **206bp.**
—, *Diphyllobothrium latum* **123a.**
—, *Ditylenchus dipsaci* of sugar-beet **43x.**
—, *Echinuria uncinata* **194c.**
—, *Filicollis anatis* **206bo.**
—, *Hepaticola hepatica* **203bw.**
—, hydatid 93b.
—, lungworms **123b.**
—, *Metastrongylus elongatus* **72i.**
—, *Plagiorchis arcuatus* **206bq.**
—, *Radopholus similis* **48q.**
—, *Schistosoma haematobium* **222n.**
—, *Tetrameres fissispina* **194c.**
Pea, *Heterodera trifolii* in **43v.**
—, *Hoplolaimus uniformis* & *Fusarium oxysporum* in **68d.**
Peach, see also Fruit-trees.
—, *Pratylenchus penetrans* in **27a.**
Peanut, *Belonolaimus longicaudatus* in **49e.**
—, *Pratylenchus brachyurus* on **48j.**
—, *Rotylenchulus reniformis* in **49e.**
Perca fluviatilis, *Diphyllobothrium latum* in **123a.**
Perdix perdix, helminths in **1h.**
Peromyscus leucopus noveboracensis, *Rictularia coloradensis* in **35n.**
Peru, see also Americas.
—, helminths in domestic animals **210a.**
Pescadores Island, see also China, Formosa.
— —, filariasis **143a.**
Petalodistomum floridensis n.comb. for *Nagmia floridensis* **89c.**
Pfenderius, synonymy **135a.**
— *heterocaeca* in Indian elephant, morphology **135a.**
— *papillatus* in Indian elephant, morphology **135a.**
Phagicola longicollis in dog in Egypt **76a.**
Phaseolus vulgaris, *Heterodera trifolii* in **43v.**
Pheasant, see also Galliformes.
—, *Syngamus* in **113a.**
Philophthalmus offlexorius n.sp. in *Tringa incana* in Russia **203bo.**
— (*Philophthalmus*) *offlexorius* n.sp. in *Tringa incana* in Russia **203bo.**
Phoenicurus p. phoenicurus, *Aprocta skrjabini* n.sp. in **203bm.**
Phyllobothrium sinuosiceps n.sp. in *Hexanchus griseus* **47c.**
Physa gyrina, *Cercaria robinsonensis* n.sp. in **162a.**
Physaloptera praeputialis in grasshoppers in Brazil **58a.**
Physiology, see also Biochemistry, Bionomics, Chemistry, Histochemistry.
—, *Ascaridia galli* **59c.**
—, *Ascaris lumbricoides* **106a.**
—, *Australorbis glabratus* **222d.**
—, *Calliobothrium verticillatum* **36g.**
—, *Dictyocaulus filaria* **130bl.**
—, eelworms of plants **130e.**
—, *Gynaecotyla adunca* **36h.**
—, *Hirudo medicinalis* **177a.**
—, *Moniliformis dubius* **36m.**
—, *Parascaris* **206bk.**
—, *Schistosoma mansoni* **36 l,** 222p.
—, *Schistosomatium douthitti* **36 l.**
—, *Strongyloides papillosus* larvae **36i.**
—, *Trichinella spiralis* larvae **36b.**
Physocephalus sexalatus larva in animals in Russia **203cd.**
Pig, see also Animals domestic.
—, ascarids & bacteria of **137a.**
—, *Ascaris* in **18a, 153e.**
—, — & hepatitis in **194a.**
—, — *suum* in **8a.**
—, *Ascarops strongylina* in **130ba.**
—, cysticerciasis in **130bj.**
—, *Cysticercus cellulosae* in **18e.**
—, ditrazine **206x.**
—, hexachlorethane **203cl.**
—, hygromycin B 66a, **71b.**
—, *Hyostrongylus rubidus* in **72f.**
—, metastrongyles in **93e.**
—, *Mestastrongylus* & infectious encephalomyelitis in **194b.**
—, — spp. in **128b,** 130bp.
—, — *elongatus* in **72i.**
—, piperazine **51a.**
—, *Schistosoma mansoni* in **109a.**
—, *Toxocara canis* larvae in **93d.**

Pig, *Trichinella* in **59a.**
—, *Trichuris trichiura* in **215a.**
Pinus elliottii, *Tylenchorhynchus ewingi* n.sp. on **43d.**
Pisciamphistoma reynoldsi n.sp. in *Lepomis* spp. in U.S.A. **148a.**
Pisidium amnicum, *Cercaria* n.sp. in **219d.**
Plagioporus spp. discussed **203bg.**
Plagiorchis arcuatus in fowl, life-history **206d.**
— — — —, pathology **206bq.**
— *cirratus cirratus* in mouse **76b.**
— *dubnicki* n.sp. in fox in Russia **206r.**
— *ovoidalis* n.sp. in *Capella* spp. in Russia **203bo.**
— *vespertilionis* in *Lepus timidus*, first record **203bi.**
— (*Multiglandularis*) *ovoidalis* n.sp. in *Capella* spp. in Russia **203bo.**
Planorbis planorbis, *Paralepoderma progeneticum* in **203bj.**
Plants, see also Cereals, Fruit trees, Gramineae, Grasses, Trees, Vegetables, Weeds, generic & popular names.
—, *Belonolaimus gracilis* in **48h.**
—, — *longicaudatus* in **49f.**
—, *Ditylenchus destructor* in **68b.**
—, — *dipsaci* in **198d.**
—, — — races on **48g.**
—, eelworms in **2a, 2b, 4a, 22a, 26a, 43c, 49o, 65b, 68c, 130e,** 163a, **169a, 198s, 203bf, 203bt, 203cq,** 203cv, 213g, 213h, 213j.
—, *Heterodera* spp. in **198l, 203di.**
—, — *trifolii* in **43v.**
—, *Meloidogyne* in **203y, 203di.**
—, — spp. in **43t.**
—, nematodes in **198b.**
—, *Pratylenchus* spp. in **35i.**
—, — *brachyurus* in **48i.**
—, — *zeae* in **48i.**
—, technique for extracting eelworms from **155a.**
Pneumostrongylus of Dougherty, 1945 to *Elaphostrongylus* **31a.**
Poa pratensis, *Helicotylenchus* n.spp. in **35a.**
Podiceps ruficollis, *Tatria antipini* n.sp. in **206o.**
— —, — *erschovi* n.sp. in **206o.**
Podocotyle mycteropercae n.sp. in *Mycteroperca falcata* **207a.**
Poland, cercariae in *Coretus corneus* **1c.**
—, *Galba truncatula* **1f.**
—, helminths in fresh-water fish **1a.**
—, — — man **73c.**
—, — — *Perdix perdix* **1h.**
—, — — *Talpa europaea* **1i.**
—, *Trichinella spiralis* **1g.**
—, trichinelliasis 166a.
Polynesia, see also Pacific Islands.
—, filariasis **222bj.**
Populus tremuloides, *Tylenchorhynchus brevicaudatus* n.sp. on **43d.**
Porrocaecum larvae from *Gadus callarias*, culture *in vitro* **47f.**
— spp. in birds in Germany, reviewed **158a.**
— *clerci* in Germany, first record **158a.**
— *crassum* in duck, treatment **206bi.**
— *depressum*, synonymy **158a.**
— *ensicaudatum* in *Turdus merula*, life-history **84g.**
— *heteroura* synonym of *P. semiteres* **158a.**
— — in *Tringa glareola*, life-history **130x.**
Porrocaecum picae n.comb. for *Ascaris picae* **158a.**
— *semiteres*, synonymy **158a.**
Potato, *Bunonema estonicum* n.sp. in **43q.**
—, *Ditylenchus destructor* in **49i, 130u, 204a,** 213i.
—, eelworms in **112a.**
—, *Heterodera rostochiensis* in **198j, 198t, 216a, 218.**
—, *Hexatylus vigissi* in **206bs.**
—, *Meloidogyne incognita* in **48n.**
—, technique for diagnosing *Ditylenchus destructor* in **213d.**
—, toxicity of sulphur dioxide to **43r.**
—, sweet, see Sweet-potato.
Poultry, see also Animals domestic, Duck, Fowl, Goose, Turkeys.
—, helminths in **44b, 206v.**
—, nematodes in **196a.**
—, *Prosthogonimus pellucidus* in **130m.**
Pratylenchus spp., general account **198i.**
— — in plants in U.S.A. **35i.**
— *brachyurus*, host list & ecology in U.S.A. **35i.**
— — on peanut, dibromochloropropane **48j.**
— — in plants, host preferences & effect of soil type **48i.**
— *convallariae* n.sp. in *Convallaria majalis* **43l.**
— *helophilus* n.sp. **43l.**
— *penetrans* & peach replant failure **27a.**
— — — soil tiredness in tree nurseries, D-D **65a.**
— — — *Tylenchorhynchus martini* on red clover, biology & pathogenicity **48p.**
— *vulnus* in avocado, D-D **212a.**
— *zeae*, host list & ecology in U.S.A. **35i.**
— — in plants, host preferences & effect of soil type **48i.**
Proctoeces macrovitellus to *Diplangus macrovitellus* n.comb. **89c.**
Proneochasmus argentinensis to *Paraspina argentinensis* n.comb. **207a.**
Prosthogonimus anatinus synonym of *P. pellucidus* **130m.**
— *pellucidus* in poultry, morphology, life-history & synonymy **130m.**
Pseudapatemon tiaratus n.sp. in *Capella stenura* in Russia **203bo.**
Pseudaproctella ardae n.comb. for *Carinema ardae* Mawson, 1957 **10b.**
— *graucalinum* n.comb. for *Carinema graucalinum* Johnston & Mawson, 1940 **10b.**
— *inornata* n.comb. for *Ornithofilaria inornata* Anderson, 1956 **10b.**
— *nuda* redescribed **10b.**
Pseudocreadium biminensis n.sp. in *Balistes capriscus* **207a.**
— *myohelicatum* synonym of *P. scaphosomum* **207a.**
— *scaphosomum*, synonymy **207a.**
Pseudodiscus collinsi, morphology **172a.**
— *hawkesii* in Indian elephant, morphology **135a.**
Pseudoechinorhynchus clavula larva in *Pallasea quadrispinosa*, first record **219f.**
Pseudoplatystoma corruscans, *Eustrongyloides* sp. larva in **180a.**
Pterocles personatus, *Aproctella milloti* n.sp. in **10d.**
Pterostichus vulgaris, intermediary for *Staphylocystis furcata* **1e.**
Puerto Rico, see also West Indies.

Puerto Rico, *Australorbis glabratus* **127a, 127b.**
— —, eelworms in sugar-cane **181a.**
— —, nematodes in man **110a.**
— —, schistosomiasis mansoni **7g.**
Pythium arrhenomenes controlled by *Aphelenchus avenae* **49r.**

Rabbit, see also Animals laboratory, Rodents, generic names.
—, *Clonorchis sinensis* in **40g.**
—, *Fasciola hepatica* in **215b.**
—, *Graphidium strigosum* in **42e.**
—, — — & myxomatosis in **42e.**
Radix auricularia, Echinostoma paraulum in **196e.**
— —, *Notocotylus attenuatus* in **196e.**
— *pereger, Cercariaeum pereger* n.sp. in **219d.**
— —, *Xiphidiocercaria VII* n.sp. in **219d.**
Radopholus lavabri in rice in Cameroons **192a.**
— *similis* in banana in Brazil, first record **107a.**
— — — citrus, control **49d.**
— — — —, pathology **48q.**
— — — —, treatment **49v.**
— — & spreading decline in citrus, elimination of eelworms not preventing disease **49m.**
Raja spp., *Ditrachybothridium macrocephalum* n.g., n.sp. in **47k.**
— *radiata, Calicotyle kroyeri* in **42h, 42i.**
— —, *Dictyocotyle coeliaca* in **42h, 42i.**
Rana esculenta intermediary for *Echinoparyphium spiniferum* **76d.**
— *pipiens, Cephalogonimus americanus* in **182a.**
— —, *Glypthelmins facioi* n.sp. in **182a.**
— —, *Megalodiscus temperatus* in **182a.**
— *temporaria, Paralepoderma brumpti* in **203bj.**
Rangifer tarandus, Ascaris mosgovoyi n.sp. in **203dh.**
— —, *Capillaria* spp. in **205a.**
— —, — *rangiferi* n.sp. in **205a.**
— —, *Trichuris baskakowi* n.sp. in **130q.**
— —, — *massino* n.sp. in **130q.**
Rat, see Animals laboratory, Rodents, generic names.
—, ascarid larvae in **203cg.**
—, *Hydatigera taeniaeformis* in **35o.**
—, *Litomosoides carinii* in **77b.**
—, *Trichinella* in **203cg.**
Rattus assimilis, Neodiplostomum intermedium n.sp. in **47e.**
— *norvegicus, Echinochasmus perfoliatus* in **70b.**
— *rattus alexandrinus, Oswaldonema rysavyi* n.sp. in **29e.**
Reptiles, see also Animals, generic & group names.
—, helminths in **203da.**
Reynoldstrema n.g. for *Glypthelmins africana* **9a.**
Rhabditis, Euryancale marsipospora n.sp. on **159a.**
—, technique for culturing **198u.**
Rhodesia, see also Africa.
—, *Meloidogyne* spp. **43t.**
Rice, see also Cereals, Gramineae.
—, *Aphelenchoides besseyi* in **48f.**
—, effect of fumigants & fertilizers on yield **49c.**
—, *Radopholus lavabri* in **192a.**
—, *Tylenchorhynchus martini* in **49c.**
— seed, *Aphelenchoides besseyi* in **48e.**
— —, — *oryzae* in **203bh.**
Rictularia coloradensis in *Peromyscus leucopus noveboracensis*, life-history **35n.**
— *sibiricensis* n.sp. in *Clethrionomys rutilus* in Russia **203br.**
Rodents, see also Animals, Mammals, generic & group names.
—, helminths in **187a.**
—, *Hepaticola hepatica* in **203bv, 203bw.**
—, visceral larva migrans in **203r.**
Rotylenchulus reniformis in cotton **49e.**
— — — peanut **49e.**
Ruanda-Urundi, see also Africa.
—, *Trichobilharzia duboisi* n.sp. **190b.**
Ruminants, see also Animals, Mammals, generic & group names.
—, carbon tetrachloride **153d.**
—, dictyocauliasis in **203bx.**
—, helminths in **29a.**
—, hydatid in **28c.**
—, *Parabronema skrjabini* in **203ba.**
Rupicapra rupicapra, lungworms in **123b.**
Russia, see also Estonia, Latvia, Mongolia.
—, acanthocephalan larvae **219f.**
—, acanthocephalans **203g.**
—, *Amidostomum orientale* n.sp. **130h.**
—, *Amurotrema dombrowskajae* n.g., n.sp. **203h.**
—, *Anomotaenia ancora* n.sp. **203bo.**
—, — *nymphaea* f. *megacantha* n. forma **84c.**
—, *Aphelenchoides panaxi* n.sp. **206bu.**
—, — *parietinus* **206bu.**
—, *Aprocta skrjabini* n.sp. **203bm.**
—, *Ascaridia* spp. 196c.
—, *Ascaris mosgovoyi* n.sp. **203dh.**
—, *Asymphylodora progenetica* **203bj.**
—, *Calicophoron calicophorum* **130c.**
—, — *erschowi* n.sp. **130c.**
—, cercariae in fresh-water molluscs **219d.**
—, cestode larvae 195a.
—, cestodes in Anseriformes **203cc.**
—, — — birds **84c, 203ct.**
—, *Cloacitrema deltoida* n.sp. **203bo.**
—, *Crepidostomum nemachilus* n.sp. **84a.**
—, *Diphyllobothrium* **206h.**
—, *Diplotriaena affinis* **130g.**
—, — *manipoli* **219a.**
—, *Ditylenchus destructor* **204a.**
—, *Echinocotyle paranitidulans* n.sp. **219e.**
—, *Echinoparyphium petrowi* **203bj.**
—, eelworms in Gramineae **130a.**
—, — — plants **203bf, 203bt,** 203cv.
—, — — soil **203i.**
—, *Eurytrema media* n.sp. **206w.**
—, filariids **130i.**
—, fresh-water snails **206i.**
—, *Habronema imbricata* **130g.**
—, *Heligmosomum petrovi* n.sp. **84a.**
—, helminthology 203a, 203ci.
—, helminths 203de.
—, — in animals **203cn.**
—, — — Anura **219c.**
—, — — birds **203cs, 219e.**
—, — — Charadriiformes **203bn.**
—, — — *Cygnus bewickii* **203cb.**
—, — — dog **206m.**
—, — — fresh-water fish **206q.**
—, — — Galliformes **203bn.**
—, — — goose **195b.**

Russia, helminths in goose & duck **196e.**
—, — — hares **203bi.**
—, — — jirds **203k.**
—, — — mammals **206 l.**
—, — — man **203cy.**
—, — — *Mogera robusta* **206u.**
—, — — poultry **206v.**
—, — — reptiles **203da.**
—, — — *Saiga tatarica* **206p.**
—, — — sheep **29g.**
—, — — — & goat **203c.**
—, — — *Talpa europaea* **206t, 206u.**
—, *Heterodera avenae* **203bp.**
—, — *cacti* **203dd.**
—, hookworms **203cx.**
—, *Longistriata vigisi* n.sp. **206t.**
—, *Marshallagia petrovi* n.sp. **203f.**
—, *Mastophorus petrowi* n.sp. **206 l.**
—, *Meloidogyne* **203y.**
—, *Neascus cuticola* **79c.**
—, nematodes in birds **219a.**
—, — — poultry **196a.**
—, *Nematoparataenia skrjabini* n.sp. **206n.**
—, *Opisthorchis* **195c.**
—, *Parafilaria* **206e.**
—, *Paralepoderma brumpti* **203bj.**
—, — *progeneticum* **203bj.**
—, *Parastrongyloides skrjabini* n.sp. **206t.**
—, *Philophthalmus offlexorius* n.sp. **203bo.**
—, *Physocephalus sexalatus* **203cd.**
—, *Plagiorchis dubnicki* n.sp. **206r.**
—, — *ovoidalis* n.sp. **203bo.**
—, *Pseudapatemon tiaratus* n.sp. **203bo.**
—, *Rictularia sibiricensis* n.sp. **203br.**
—, *Serratospiculum chungi* **219a.**
—, *Shipleya dioica* n.sp. **84h.**
—, *Spirocerca lupi* **203cd.**
—, *Subulura strongylina* **219a.**
—, *Tatria* n.spp. **206o.**
—, *Tetrameres uxorius* n.sp. **203bo.**
—, *Thominx fulicae* n.sp. **130f.**
—, — *sadovskajae* n.sp. **203br.**
—, trematodes in birds **203 l.**
—, *Wardium nyrocae* n.sp. **203cc.**
Rutilus rutilus, Diplozoon homoion on **79d.**

Saiga tatarica, helminths in **206p.**
— —, *Moniezia expansa* in **79i.**
— —, *Thysaniezia giardi* in **79i.**
Saintpaulia ionantha, Meloidogyne arenaria thamesii in **191a.**
Scarabaeus sacer, Moniliformis moniliformis larva in **203bs.**
Schistosoma in man, immunological diagnosis **88a.**
— *bovis* & disease in sheep **179a.**
— — intermediary in Sudan **222f.**
— *haematobium* intermediaries in Sudan **222f.**
— — in man 82a.
— — — —, 6171 RP **154b.**
— — — — in Angola **88h.**
— — — — — French West Africa, new foci **154a.**
— — — — — Mozambique, pathology **222n.**
— — — —, TWSb **222u.**
— *japonicum*, geographical strains **222h.**
Schistosoma japonicum in *Oncomelania*, sex of snail not affecting sex of cercaria **77a.**
— *mansoni* in *Australorbis glabratus*, cercarial emergence & longevity **110e.**
— — cercaria, collagenase not present **36 l.**
— — —, effect of copper compounds **222y.**
— —, factors affecting circum-oval precipitin in immune sera **58d.**
— —, immunity & serology **35g.**
— — intermediaries, nomenclature **42j.**
— — in man & animals, host-parasite relationships **110c.**
— — — —, diagnosis 161a.
— — — —, fractionation of sera **36a.**
— — — —, glucosamine **95a.**
— — — —, potassium antimony dimercaptosuccinate **222k.**
— — — —, serology **222j, 222m.**
— — — —, sodium antimony gluconate **222k.**
— — — —, — pyrocatechol antimony disulphonate **222k.**
— — — —, surgical treatment 139a.
— — — monkey, miracil-D **222x.**
— — — mouse, longevity of ova in tissues **7b.**
— — — —, skin penetration **222i.**
— —, nutrition & growth *in vitro* 222p.
— — & oesophageal varices in mouse 222 o.
— — in pig in Brazil **109a.**
— — strains in Brazil **131d.**
— —, technique for testing anthelmintics against **222x.**
Schistosomatium douthitti cercaria, collagenase not present **36 l.**
— —, immunity & serology **35g.**
Schistosome cercariae in snails in U.S.A. **162a.**
— dermatitis in man in North America **222bb.**
— intermediaries, biological control **222g.**
— — discussed **222b.**
— — in Mozambique **88e.**
Schistosomiasis of cervix in man 116b.
— in man in Africa 222a.
— — — — Angola **88g.**
— — — & animals in Iraq **222w.**
— — — in Brazil, control **222ba.**
— — — — Egypt 222a, 222 l.
— — —, glucosamine ineffective **141a.**
— — —, M & B 2948A **141e.**
— — — in Mauritania 222r.
— — — — Mozambique **88d.**
— — —, stibophen, effect on liver function **141f.**
— — —, treatment **141b.**
—, pictorial account **74a.**
—, technique for diagnosing **86a.**
— of vulva in man 116c.
— haematobia in man, TWSb **121b.**
— — — — in Tanganyika, survey **41a.**
— —, surgical treatment 141d.
— mansoni in Puerto Rico, control **7g.**
Schizamphistomatinae emended **203h.**
Schrankiana brasili to *Schrankianella* n.g. **104a.**
— *formosula* n.sp. in *Leptodactylus typhonius* in Brazil **104a.**
— *inconspicata* n.sp. for *S. schranki* of Fahel, 1952 & Walton, 1953 **104a.**
— *larvata* redescribed **104a.**
— *schranki* of Fahel, 1952 & Walton, 1953 to *S. inconspicata* n.sp. **104a.**

Schrankiana schranki redescribed **104a.**
Schrankianella n.g. for *Schrankiana brasili* **104a.**
Schrankianidae n.fam. **104a.**
Schrankianinae nom.nov. for Schrankiinae **104a.**
Schrankiinae to Schrankianinae nom.nov. **104a.**
Sciaenidae, see also Fish, generic & group names.
—, *Mexicana bychowskyi* n.g., n.sp. on **89b.**
Sciurus vulgaris, *Mastophorus petrowi* n.sp. in **206 l.**
Scleranthus annuus, *Heterodera scleranthii* n.sp. in **203di.**
Scutellonema boocki, morphology **180b.**
— *clathricaudatum* n.sp. on *Gossypium hirsutum* **43g.**
— *dioscoreae* n.sp. on yam **58c.**
Scyliorhinus caniculus, *Ditrachybothridium macrocephalum* n.g., n.sp. in **47k.**
Semisulcospira cancellata, *Echinostoma revolutum* in **196e.**
Serology, see also Immunology.
—, ascariasis **80a.**
—, cysticerciasis **166c.**
—, dictyocauliasis **203bx.**
—, *Dirofilaria immitis* **222cb.**
—, helminths **206j.**
—, hydatid **7e, 7f.**
—, *Loa loa* **222br.**
—, paragonimiasis **222cm.**
—, *Schistosoma mansoni* **35g, 36a, 222j, 222m.**
—, *Schistosomatium douthitti* **35g.**
—, *Trichinella spiralis* **120a.**
—, tropical eosinophilia **7k.**
—, visceral larva migrans **144a, 222ck.**
—, *Wuchereria bancrofti* **222ca.**
Serratospiculum chungi in Russia, first record **219a.**
Setaria in *Cervus* spp., localization & seasonal dynamics **203bl.**
— *equina* larva, morphology **206a.**
Sheep, see also Animals domestic, Ruminants.
—, bephenium embonate **72h.**
—, carbon tetrachloride **206bb.**
—, — —, effect on gastro-intestinal tract **206z.**
—, cestode larvae in 195a.
—, *Coenurus* in **44a, 45a, 195d.**
—, cyanacethydrazide **153b.**
—, dictyocauliasis in **203p.**
—, *Dictyocaulus* in **206bm.**
—, — *filaria* in **203j, 206bn, 206bp.**
—, difluorotetrachlorethane **203w.**
—, Dipterex **30e.**
—, ditrazine phosphate **153b.**
—, — salts **203bu.**
—, *Eurytrema media* n.sp. in **206w.**
—, *Fasciola* spp. in **203t.**
—, — *gigantica* in **203s.**
—, — *hepatica* in lung of **37b.**
—, fascioliasis in **206bc.**
—, — & "black disease" in **72c.**
—, *Haemonchus contortus* in **42d.**
—, helminths in **29g, 189a, 203c.**
—, hetrazan **128d.**
—, hexachlorethane **206bb.**
—, hydatid in **44a,** 93b.
—, lead arsenate **97a.**
—, liver-fluke in **30d.**
—, lungworms in **60c, 215c.**
Sheep, *Marshallagia petrovi* n.sp. in **203f.**
—, *Moniezia* spp. in **206f, 206g.**
—, monieziasis in **206bj.**
—, nematodes in **63a.**
—, *Nematodirus* spp. in **3a, 72k, 72m.**
—, *Neostrongylus linearis* in **215c.**
—, organic halogen compounds **206ba.**
—, *Ostertagia ostertagi* in **130s.**
—, phenothiazine **8d, 69a.**
—, Ruelene 126a.
—, *Schistosoma bovis* & disease in **179a.**
—, strongyloidiasis in **8c, 40e.**
—, technique for assessing efficacy of treatment for lungworms **130bo.**
—, — — removing *Coenurus* from brain of **30a.**
—, *Thysaniezia giardi* in **206f.**
—, toxicity of copper compounds to **130be.**
—, — — hexachlorethane to **72e.**
Shipleya dioica n.sp. in *Limnodromus griseus scolopaceus* in Russia **84h.**
Sigmodon hispidus, *Litomosoides carinii* in **222bp, 222bq, 222bu.**
— —, symmetrical bis-isoquinolinium compounds **222bp.**
Simocephalus expinosus, 2nd intermediary for *Astiotrema trituri* **21a.**
Simulidae, see also generic names.
—, general account & control **65c.**
Simulium spp. in North America & Nigeria, control **117b.**
— *damnosum*, control **222bi.**
— —, general account **222bg.**
Skrjabinocta petrowi Chertkova, 1946 to *Splendidofilaria petrowi* n.comb. **10b.**
Snails, see also Molluscs, generic names.
—, *Cercaria* 12 n.spp. in **35b.**
—, control by chlorinated phenols **153a.**
—, new trends in research 222e.
—, schistosome cercariae in **162a.**
—, fresh-water, cercariae in **76d.**
—, —, in Russia **206i.**
Snakes, see also Reptiles, generic names.
—, *Amplicaecum schikhobalovi* in **203bq.**
Soil, *Ditylenchus* in 213c.
—, eelworms in **49w, 78a, 127c, 203i.**
—, *Meloidogyne* in 213 l.
—, technique for detecting *Heterodera rostochiensis* in 213e.
—, — — extracting eelworms from **155a.**
Solomon Islands, see British Solomon Islands.
Somateria spectabilis, *Amidostomum orientale* n.sp. in **130h.**
South Africa, see also Africa.
— —, *Meloidogyne* **64a.**
Soya bean, *Heterodera glycines* in **48m.**
— —, *Meloidogyne* spp. in **48b.**
— —, — *incognita* var. *acrita* in **35d.**
Spain, helminths in cat & dog **59b.**
—, — — rodents **187a.**
Spirina gerlachi n.sp. **102a.**
Spirocerca lupi in dog 81a.
— — larva in animals in Russia **203cd.**
Spironoura congolense synonym of *S. pisciola* **76e.**
— *piscicola* n.comb. for *Nematoxys piscicola* **76e.**
Spirorchis elegans in *Chrysemys picta belli*, localization **170a.**
— — — — *p. picta*, life-history **35m.**

Spirorchis pseudemyae in *Chrysemys picta belli* & *Emys blandingi*, first record **170a.**
Splendidofilaria gretillati n.sp. in *Agapornis cana* **10d.**
— —, microfilaria described **10e.**
— *papillocerca* n.comb. for *Ularofilaria papillocerca* Lyubimov, 1946 **10b.**
— *petrowi* n.comb. for *Skrjabinocta petrowi* Chertkova, 1946 **10b.**
Splendidofilariinae revised **10b.**
Sprostonia asiatica n.sp. on *Callichrous pabda* **47h.**
— *gomtia* n.sp. on *Eutropiichthys vacha* **47h.**
— *indica* n.g., n.sp. on *Eutropiichthys vacha* **47h.**
— *wallagonia* n.sp. on *Wallagonia attu* **47h.**
Staphylocystis furcata, life-history **1e.**
Stephanofilaria & summer sores in cattle in Germany **34b.**
Stephanostomum admicrostephanum synonym of *S. microstephanum* **207a.**
— *cubanum* synonym of *S. ditrematis* **207a.**
— *ditrematis*, synonymy **207a.**
— *lopezneyrai* synonym of *S. sentum* **207a.**
— *manteri* synonym of *S. ditrematis* **207a.**
— *mediovitellarium* synonym of *S. sentum* **207a.**
— *microstephanum*, synonymy **207a.**
— *provitellosum* n.sp. in *Balistes* spp. **207a.**
— *pseudocarangis* n.sp. in *Holocentrus ascensionis* **207a.**
— *sentum*, synonymy **207a.**
Sterrhurus tabogonus n.sp. in *Gymnothorax dovii* **207a.**
Strawberry, *Ditylenchus dipsaci* in **203cz.**
—, *Meloidogyne hapla* in **178a.**
Strongyloides cebus synonym of *S. fülleborni* **28b.**
— *fülleborni*, morphology, life-history & synonymy **28b.**
— *papillosus* larvae, Krebs cycle **36i.**
— *simiae* synonym of *S. fülleborni* **28b.**
— *stercoralis* in man, dithiazanine **87a.**
— — — — — in Greece 82c.
Strongyloidiasis in man, general account 131a.
— — — in U.S.A. 147a.
— — sheep & goat, experimental **8c, 40e.**
Subulura strongylina in Russia, first record **219a.**
Sudan, see also Africa.
—, helminths in domestic animals **67a.**
—, onchocerciasis **13e.**
—, *Schistosoma bovis* intermediary **222f.**
—, — *haematobium* intermediaries **222f.**
Sugar-beet, see also Beet.
—, *Heterodera schachtii* in 24a, **43w, 206bt.**
Sugar-cane, eelworms in **46a, 181a.**
—, — associated with **49 l.**
—, *Meloidogyne* in **64a.**
Sus scrofa, hydatid in **128c.**
Sweet-potato, *Meloidogyne incognita* var. *acrita* in **48d.**
Syngamus in fowl, treatment **189b.**
— — pheasant, treatment by aerosols **113a.**
— *skrjabinomorpha* & *S. trachea* in fowl, hybridization **203dc.**
— *trachea* & *S. skrjabinomorpha* in fowl, hybridization **203dc.**

Taenia saginata in man, treatment **29i.**
Taeniasis in man, Cestodin **125a.**
Talpa europaea, helminths in **1i, 206t, 206u.**
— —, *Ityogonimus lorum* in **47g.**
— —, — *ocreatus* in **47g.**
— —, *Longistriata vigisi* n.sp. in **206t.**
— —, *Omphalometra flexuosa* in **47g, 76b.**
— —, *Parastrongyloides skrjabini* n.sp. in **206t.**
Tanganyika, see also Africa, East Africa.
—, filariasis bancrofti **222bn.**
—, *Hoplolaimus angustalatus* n.sp. **43p.**
—, schistosomiasis haematobia **41a.**
Tatria discussed **206o.**
— *antipini* n.sp. in *Podiceps ruficollis* in Russia **206o.**
— *erschovi* n.sp. in *Podiceps ruficollis* in Russia **206o.**
Taxonomy, *Dirofilaria* spp. **111a.**
—, Eoacanthocephala **10a.**
—, Filarioidea **10c.**
—, *Paradilepis* **130p.**
—, Splendidofilariinae **10b.**
—, Tylenchida **1d, 203ch, 206br.**
Technique for assessing efficacy of treatment of sheep for lungworms **130bo.**
— — concentrating helminth ova in faeces 186f.
— — counting *Fasciola* ova **71c.**
— — culturing *Anisakis* larvae **47f.**
— — — *Ditylenchus dipsaci* **198d.**
— — — *Fascioloides magna* **35 l.**
— — — & freeze-drying *Harposporium anguillulae* in eelworms **42g.**
— — — *Haemonchus contortus* in vitro **42b.**
— — — *Ostertagia* spp. in vitro **42b.**
— — — *Porrocaecum* larvae **47f.**
— — — *Rhabditis* **198u.**
— — detecting helminth ova in faeces **30c.**
— — — *Heterodera rostochiensis* in soil 213e.
— — determining viability of ascarid larvae **203bz.**
— — — — — — helminth ova **203e.**
— — diagnosing *Ditylenchus destructor* in potato **213d.**
— — — schistosomiasis **86a.**
— — — trichinelliasis **139b.**
— — estimating dosage of sodium pentachlorophenate **117c.**
— — — eelworm populations **198m.**
— — — nematode larvae in suspension **53a.**
— — extracting eelworms from plants & soil **155a.**
— — isolating fungi attacking eelworms **48c.**
— — preparing 1-bromo-2-naphthol 115a.
— — — *Clonorchis sinensis* antigen **36f.**
— — — helminth antigens **101a.**
— — — & mounting *Heterodera* vulval cones **198g.**
— — removing *Coenurus* from brain of sheep **30a.**
— — setting up hatching tests on *Heterodera rostochiensis* **198o.**
— — studying *Meloidogyne incognita* host-parasite relationship **43f.**
— — — nutrition of *Caenorhabditis briggsae* **198v.**
— — testing anthelmintics against *Schistosoma mansoni* **222x.**
— — transferring eelworms from fixative to glycerin **43i.**
Tegumaea synonym of *Pfenderius* **135a.**
Tetracotyle in *Helobdella stagnalis* **42f.**

Tetrameres fissispina in duck, symptoms & pathology **194c.**
— *uxorius* n.sp. in *Tringa hypoleucos* in Russia **203bo.**
— (*Tetrameres*) *uxorius* n.sp. in *Tringa hypoleucos* in Russia **203bo.**
Tetrao urogallus, *Capillaria alpina* n.sp. in **18c.**
— —, helminths in **18c.**
Thelazia in cattle, treatment **209b.**
— spp. in cattle, control **203bb.**
— — — — in Czechoslovakia, treatment **128a.**
— *lacrymalis* in horse in Mongolia **203z.**
Thominx fulicae n.sp. in *Fulica atra* in Russia **130f.**
— *sadovskajae* n.sp. in *Apodemus flavicollis*, *Clethrionomys glareolus* & *Microtus arvalis* in Russia **203br.**
Thysaniezia giardi in *Saiga tatarica* **79i.**
— — — sheep, seasonal & age variation **206f.**
Tobacco, *Meloidogyne incognita* & black shank in **35j.**
—, — — var. *acrita* & black shank in **35j.**
Tomato, see also *Lycopersicon.*
—, *Heterodera rostochiensis* in **198j.**
—, *Meloidogyne* in **49n, 213a, 213m.**
—, — spp. in **150a.**
—, — *hapla* in **43e.**
—, — *javanica* in **43e.**
Toxicity of copper compounds to sheep **130be.**
— — dithiazanine to animals **113b.**
— — Freon-112 to cattle **206bd.**
— — hexachlorethane to cattle & sheep **72e.**
— — nitrated aluminium naphtholate to man **141c.**
— — *Parascaris* proteins to guinea-pig **206bl.**
— — sulphur dioxide to potato **43r.**
Toxocara canis larvae in pig **93d.**
— — in silver fox, benzine **193a.**
Trachinotus goreensis, *Hurleytrema trachinoti* n.sp. in **40h.**
Treatment, see also Anthelmintics, Control, Nematicides (plant-eelworm).
—, ancylostomiasis 186a.
—, *Aphelenchoides besseyi* **48e.**
—, *Ascaridia galli* **96b.**
—, *Coenurus* **195d.**
—, creeping eruption **14a.**
—, dictyocauliasis **203p.**
—, *Diphyllobothrium* 186h.
—, *Ditylenchus* 213c.
—, — *destructor* **49i.**
—, eelworms in plants **198s.**
—, elephantiasis **11a.**
—, *Fasciola gigantica* **203s.**
—, fascioliasis **206bc.**
—, helminthiasis **13a.**
—, helminths in man 115d, **129a, 153c.**
—, *Hymenolepis nana* 186g.
—, *Hyostrongylus rubidus* **72f.**
—, liver-fluke **30d.**
—, *Meloidogyne* 213l.
—, — spp. **49p.**
—, nematodes & diarrhoea 186b, 186d.
—, — in man 186e.
—, *Porrocaecum crassum* **206bi.**
—, *Radopholus similis* **49v.**
—, *Schistosoma mansoni* 139a.
Treatment, schistosomiasis **141b.**
—, — haematobia 141d.
—, *Syngamus* **113a, 189b.**
—, *Taenia saginata* **29i.**
—, *Thelazia* **209b.**
—, — spp. **128a.**
Tree nurseries, *Pratylenchus penetrans* & soil tiredness in **65a.**
Trematodes, see also Digenea, Monogenea.
— in birds in Russia, geographical characteristics **203l.**
—, determination of fertility **73b.**
— in dog in Egypt **76a.**
— — fish in Czechoslovakia **60d.**
— — marine fish in Ghana **40h.**
Triaenophorus lucii & *Drepanidotaenia lanceolata* in *Cyclops* spp., interspecific relationship 79h.
Tribolium confusum, intermediary for *Rictularia coloradensis* **35n.**
Trichinella in mammals, diagnosis **122b.**
— not present in rodents & insectivores in Hungary **29h.**
— in pig, diagnosis by antigen **59a.**
— — rat, state of nervous system affecting infection **203cg.**
— *spiralis* antigens **120a,** 206k.
— — in laboratory animals, garlic **60b.**
— — larvae, anaerobic glycolysis **36b.**
— — in mammals in U.S.A. **40f.**
— — — man in Poland **1g.**
Trichinelliasis in man in Poland 166a.
— — — — U.S.A. **56a, 173b.**
—, technique for diagnosing **139b.**
Trichobilharzia spp., morphology **190b.**
— *duboisi* n.sp. in *Nettapus auritus* in Ruanda-Urundi **190b.**
Trichogaster fasciatus, *Clinostomum* metacercariae in **33a.**
Trichostrongylus axei in *Castor fiber*, first record **206s.**
Trichuriasis, epidemiology **203by.**
Trichuris baskakowi n.sp. in *Rangifer tarandus* **130q.**
— *massino* n.sp. in *Rangifer tarandus* **130q.**
— *trichiura* in man, dithiazanine **19a, 110b.**
— — — pig, larval migration & pathogenicity **215a.**
Tridentoinfundibulum gobi in equines, morphology **203cw.**
Tringa glareola, *Porrocaecum heteroura* in **130x.**
— *hypoleucos*, *Tetrameres uxorius* n.sp. in **203bo.**
— *incana*, *Cloacitrema deltoida* n.sp. in **203bo.**
— —, *Philophthalmus offlexorius* n.sp. in **203bo.**
Triturus vulgaris, *Astiotrema trituri* n.sp. in **21a.**
Tropicorbis, nomenclature **42j.**
Tubulovesicula anguillae synonym of *T. lindbergi* **207a.**
— *lindbergi*, synonymy **207a.**
— *serrani* synonym of *T. lindbergi* **207a.**
— *spari* synonym of *T. lindbergi* **207a.**
Tunicamermis synonym of *Skrjabinomermis* **79g.**
Turdus merula, *Porrocaecum ensicaudatum* in **84g.**
Turgida turgida in grasshoppers in Brazil **58a.**
— — larvae, differentiation between sexes **58b.**
Turkey, hydatidosis 208a.
Turkeys, see also Poultry.
—, *Ascaridia* spp. in 196c.

Turkeys, nematodes in **130b.**
Turtles, see also Reptiles, generic names.
—, helminths in **170a, 201a.**
Tylenchida, taxonomy **1d, 203ch, 206br.**
Tylenchorhynchus acti n.sp. on *Hibiscus esculentus* **43d.**
— *brevicaudatus* n.sp. on *Populus tremuloides* **43d.**
— *ewingi* n.sp. on *Pinus elliottii* **43d.**
— *martini* & *Pratylenchus penetrans* on red clover, biology & pathogenicity **48p.**
— — in rice, effect of fumigants & fertilizers **49c.**

Udeopsylla robusta, intermediary for *Rictularia coloradensis* **35n.**
Ularofilaria papillocerca Lyubimov, 1946 to *Splendidofilaria papillocerca* n.comb. **10b.**
U.S.S.R., see Russia.
U.S.A., see also Americas, North America.
— — —, *Cercaria* 12 n.spp. **35b.**
— — —, *Dictyangium chelydrae* **201a.**
— — —, Digenea **171a.**
— — —, *Echinococcus granulosus* **35c.**
— — —, eelworms in cereals **49s.**
— — —, — — — & grasses **49g.**
— — —, — — plants **169a.**
— — —, *Euryancale marsipospora* n.sp. **159a.**
— — —, helminths in *Canis latrans* **197a.**
— — —, — — man **6a.**
— — —, — — turtles **170a, 201a.**
— — —, hydatid **35c,** 99a.
— — —, Monogenea **171b.**
— — —, *Pisciamphistoma reynoldsi* n.sp. **148a.**
— — —, *Pratylenchus* spp. **35i.**
— — —, schistosome cercariae **162a.**
— — —, strongyloidiasis 147a.
— — —, *Trichinella spiralis* **40f.**
— — —, trichinelliasis **56a, 173b.**

Valvata piscinalis, *Cercaria abyssalis* n.sp. in **219d.**
— —, — *valvatae* n.sp. Ginetsinskaya, 1959 in **219d.**
— —, — — — — Lal, 1959 in **42f.**
Varanus spp., nematodes in **28a.**
— *rudicollis*, *Abbreviata borneensis* n.sp. in **28a.**
Vegetables, see also Plants, generic & group names.
—, helminth ova on **122a.**
Vertebrates, see Animals, generic & group names.
Viannella chinensis n.sp. in *Cricetulus barabensis griseus* **29e.**
Vine, eelworms in **136a.**
—, *Meloidogyne* spp. in **49p.**
Vitta for *Angularella* spp. **130j.**
— — *Anomotaenia* spp. **130j.**
— *cyathiformis* n.comb. **130j.**
— *magniuncinata* of Singh, 1952 to *V. singhi* n.sp. **130j.**
— *singhi* n.sp. for *V. magniuncinata* of Singh, 1952 **130j.**
Viviparus viviparus, *Echinoparyphium petrowi* in **203bj.**
Vulpes vulpes japonica, *Gnathostoma spinigerum* in **151a.**

Wallagonia attu, *Sprostonia wallagonia* n.sp. on **47h.**
Wardium arctica n.comb. for *Hymenolepis arctica* **79a.**
— *nyrocae* n.sp. in *Clangula hyemalis* in Russia **203cc.**
Weeds, see also Plants, generic names.
—, *Ditylenchus dipsaci* of sugar-beet on **43x.**
West Africa, see also Africa, specific territories.
— —, helminths in domestic animals **188c.**
West Indies, see also Caribbean, specific territories.
— —, helminths in man **222cq.**
— Pakistan, *Echinococcus granulosus* **28c.**
— —, hydatid **28c.**
Wiśniewski, W. L., biography 73a.
Wuchereria bancrofti, see also Filariasis.
— — in *Culex fatigans*, effect of microfilarial density on infection **133c.**
— — intermediaries in New Guinea **222bz.**
— — in man in Brazil, control **222cd.**
— — — —, diethylcarbamazine not affecting periodicity **133d.**
— — — — in Goa, reviewed **222cc.**
— — — — — India 115b, **222bx.**
— — — —, role of light infections in transmission **13d.**
— — — —, serology **222ca.**
— — microfilaria in eye of man in Madagascar 154c.
— — races in man in Pacific Islands, intermediaries **222bk.**
— *malayi*, see also Filariasis.
— — to *Brugia* n.g. **222bo.**
— — in cat, larval migration **13f.**
— — — man & animals, experimental cross-transmission **222by.**
— — — — in India **133b.**
— *pahangi* to *Brugia* n.g. 222bo.
— *patei* to *Brugia* n.g. 222bo.

Xiphidiocercaria I to *VI* n.spp. in *Lymnaea stagnalis* **219d.**
— *VII* n.sp. in *Radix pereger* **219d.**

Yam, *Scutellonema dioscoreae* n.sp. on **58c.**
Yugoslavia, helminths in *Capreolus capreolus* **70a.**

Zebu, see also Animals domestic, Ruminants.
—, haemonchiasis in **72b.**

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